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Japanese(PDF)

File Wrapper Information

FULL CONTENTS CLAIM + DETAILED DESCRIPTION TECHNICAL  
FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
PROBLEM MEANS EXAMPLE DESCRIPTION OF DRAWINGS  
DRAWINGS

[Translation done.]

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**Notes:**

1. Untranslatable words are replaced with asterisks (\* \*\* \*).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 03/16/2007 / Priority: 1. Information communication technology (ICT) / 2. Business / 3. Finance and Law

**FULL CONTENTS****[Claim(s)]**

[Claim 1] The self-ship wake behind a sailing ship including a self-ship position, and the direction of movement or the direction of a bow of the present self-ship, It is the navigation equipment which enabled it to display the picture of the cruise related information containing a depth line, such as plurality, on the display screen. The navigation equipment characterized by providing a sea bed cross-section display means to display the picture of the sea bed cross section by the side of the front in said direction of movement or the direction of a bow on said display screen, based on each depth-sounding data corresponding to the every place point for displaying a depth line, such as said plurality.

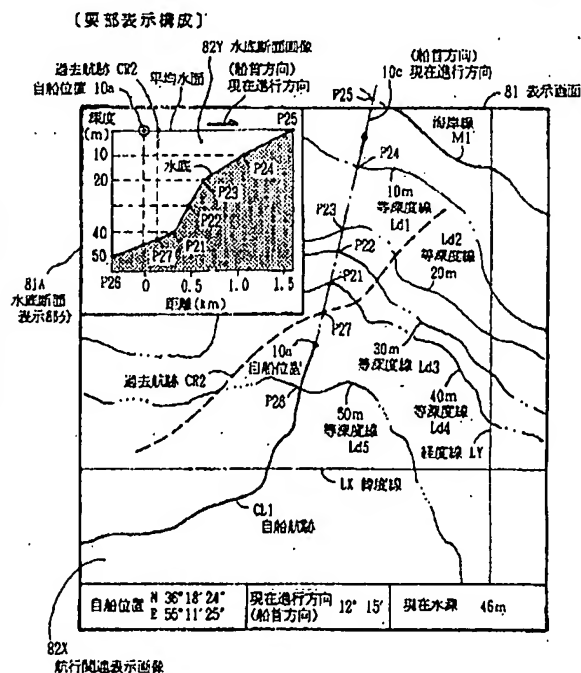
[Claim 2] The navigation equipment according to claim 1 characterized by changing a part of picture of said cruise related information into the picture of said sea bed cross section, or replacing with the whole picture of said navigation related information, and displaying the picture of said sea bed cross section only when predetermined operation is performed.

[Claim 3] The navigation equipment according to claim 1 or 2 characterized by displaying the picture of said sea bed cross section covering the range of a predetermined distance from said self-ship position.

[Claim 4] A navigation equipment given in either of Claim 1 characterized by constituting said position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment to Claim 3.

[Claim 5] A navigation equipment given in either of Claim 1 characterized by using each depth-sounding data based on a depth line of the above included in the map data memorized beforehand as said each depth-sounding data, and each depth-sounding data obtained by the water depth measurement portion to Claim 3.

[Claim 6] The navigation equipment according to claim 5 characterized by constituting said water depth measurement portion from a shoal-of-fish

**Drawing selection Representative draw**

[Translation done.]

detection device while constituting said position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment.

[Claim 7] It is based on the position measurement data of the self-ship position obtained by a position measurement portion, and the water depth measurement data of the water depth value corresponding to said self-ship position obtained by a water depth measurement portion. While being the navigation equipment which enabled it to display the picture of said cruise related information containing \*\*\*\*\* on the display screen and setting up the water depth predetermined value for creating depth lines, such as the above The 1st storage portion which memorizes the predetermined depth-sounding position value corresponding to said water depth predetermined value is prepared. A predetermined depth-sounding position value storage means to memorize into said 1st storage portion by making into said predetermined depth-sounding position value the position value of said position measurement data obtained when said water depth measurement data reaches said predetermined depth-sounding value, A segment storage means to memorize the segment prepared data for creating the segment which connects between the points of said predetermined depth-sounding position value memorized into said 1st storage portion into the 2nd storage portion, The navigation equipment characterized by providing a depth line display means, such as displaying depth lines, such as the above, on said display screen based on each data obtained by reading each memory content of said 1st storage portion and said 2nd storage portion.

[Claim 8] While setting said water depth predetermined value as a different water depth value from the water depth value of a depth line (a map etc. is hereafter called depth line), such as being contained in the map data memorized beforehand, and creating depth lines, such as the above The navigation equipment according to claim 7 characterized by adding a merge display means to merge and display depth lines, such as the above, and depth lines, such as said map.

[Claim 9] By preparing the storage portion corresponding to said two or more water depth predetermined values in said 1st storage portion and said 2nd storage portion while making said water depth predetermined value into two or more water depth predetermined values and setting it up The navigation equipment according to claim 7 or 8 characterized by displaying depth lines, such as two or more above, on said display screen.

[Claim 10] A navigation equipment given in either of Claim 7 characterized by adding a segment elimination addition means to specify the figure which displays said point, or said segment, and to eliminate storage of said segment prepared data, or to add storage of said segment prepared data to Claim 9.

[Claim 11] A navigation equipment given in either of Claim 7 characterized by constituting said water depth measurement portion from a shoal-of-fish detection device while constituting said position measurement portion from satellite electric navigation equipment or amendment electric navigation equipment to Claim 10.

[Claim 12] It is based on the position measurement data of the self-ship position obtained by a position measurement portion, and the water depth measurement data of the water depth value corresponding to said self-ship position obtained by a water depth measurement portion. While being the navigation equipment which enabled it to display the picture of the cruise related information containing \*\*\*\*\* on the display screen and setting up the water depth predetermined value for creating depth lines, such as the above The 1st storage portion which memorizes the predetermined depth-sounding position value corresponding to said water depth predetermined value is prepared. A predetermined depth-sounding position value storage means to memorize into said 1st storage portion by making into said predetermined depth-sounding position value the position value of said position measurement data obtained when said water depth measurement data reaches said predetermined depth-

sounding value, A segment storage means to memorize the segment prepared data with which between the points of the predetermined depth-sounding position value memorized into said 1st storage portion creates the segment which connects between the following [ a predetermined distance value ] into the 2nd storage portion, The navigation equipment characterized by providing a depth line display means, such as displaying depth lines, such as the above, on said display screen based on each data obtained by reading each memory content of said 1st storage portion and said 2nd storage portion.

[Claim 13] The navigation equipment according to claim 12 characterized by displaying the figure which displays the point which is not connected by said segment with a large figure while displaying the figure which displays the point connected by said segment with a small figure.

[Claim 14] The navigation equipment according to claim 12 or 13 characterized for the figure which displays the point which is not connected by said segment while expressing the figure which displays the point connected by said segment as regular brightness by brightness brighter than regular brightness or the thing which it is made to blink and is displayed.

[Claim 15] While setting said water depth predetermined value as a different water depth value from the water depth value of a depth line (a map etc. is hereafter called depth line), such as being contained in the map data memorized beforehand, and creating depth lines, such as the above A navigation equipment given in either of Claim 12 characterized by adding a merge display means to merge and display depth lines, such as the above, and depth lines, such as said map, to Claim 14.

[Claim 16] By preparing the storage portion corresponding to said two or more water depth predetermined values in said 1st storage portion and said 2nd storage portion while making said water depth predetermined value into two or more water depth predetermined values and setting it up A navigation equipment given in either of Claim 12 characterized by displaying depth lines, such as two or more above, on said display screen to Claim 15.

[Claim 17] A navigation equipment given in either of Claim 12 characterized by adding a segment elimination addition means to specify the figure which displays said point, or said segment, and to eliminate storage of said segment prepared data, or to add storage of said segment prepared data to Claim 16.

[Claim 18] A navigation equipment given in either of Claim 12 characterized by constituting said water depth measurement portion from a shoal-of-fish detection device while constituting said position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment to Claim 17.

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#### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the navigation equipment which displays the picture of two or more information of the information relevant to the cruise of the cruise position of a vessel, a wake behind a sailing ship, a cruise target point, a schedule route, depth of water, etc. (it is called ~~cruise related information~~ in this invention).

[0002]

[Description of the Prior Art] As such a navigation equipment, like drawing 13 - drawing 17, the cruise position of a self-ship, Namely, the position measurement portion which performs position measurement with the position measurement portion 10 which measures a self-ship position, for example, satellite electric navigation, loran C electric navigation, decca navigator electric navigation, etc., The composition (henceforth the 1st conventional technology) which used as another object a part for the cruise related information display 20 which displays the picture of cruise related information is common knowledge.

[0003] In addition, in each figure explained below, the portion shown with the same sign is a portion with the same function as the portion of the same sign explained in one of figures. moreover -- generally a point or a position has a latitude longitude value -- a listing -- a LOP value [ in / although the bottom considers it as a point or a position, when using the Lolland electric navigation and decca navigator electric navigation / the navigation ] -- a listing -- it is [ the bottom ] good also as a point or a position.

[0004] And generally the position measurement portion 10 by the above-mentioned electric navigation is also called ~~electric navigation equipment of an electric navigation receiver~~, and, generally the part for the above-mentioned cruise related information display 20 is also called the wake-behind-a-sailing-ship recording device.

[0005] Furthermore, for example, when the electric navigation equipment by satellite electric navigation is used as the position measurement portion 10, based on the amount of change, the change direction, etc. of the self-ship position 10a, it is constituted so that degree of self-vessel speed 10b and the direction 10c of a present progressive can also be measured besides the self-ship position 10a.

[0006] In drawing 13 and drawing 14, [ the position measurement portion 10 for example, ~~GPS (Global Positioning System) electric navigation equipment,~~ ]

The signal containing the data of self-ship position 10a, degree of self-vessel speed 10b, and the direction 10c of a present progressive is given to a part for the cruise related information display 20 as a part of cruise related information.

[0007] In addition, in this invention [ direction / of a present progressive / 10c ] The direction value which measured the direction in which the self-ship is running with electric navigation, i.e., a direction of movement, is said, and the direction which the bow of the self-ship measured [ the direction of a bow \*\*\*\* (ed) is ] like a postscript with the heading measurement portion, for example, a gyrocompass, or the magnetic compass has turned to is said.

[0008] The control processing part which the amount of [ 20 ] cruise related information display made into the subject the cruise Data Processing Division portion 70 with the control processing facility (henceforth CPU) 70A which makes a microcomputer a subject, for example, commercial CPU, and was constituted, It constitutes from a display-processing portion 80 with CPU80A which carries out a conjoint action to CPU70A, for example, the control processing part which made commercial IC for drawing processing the subject, and constituted it.

[0009] [ and the data of self-ship position 10a, degree of self-vessel speed 10b, and the direction 10c of a present progressive ] Through input/output port 71A, i. e., an I/O portion, it is taken into the cruise Data Processing Division portion 70, and [ the data of the self-ship position 10a ] Based on the setups operated and given, the part for the after-mentioned setting control unit 60 is taken in for every predetermined time and every predetermined distance interval, and is ~~memorized in the memory 74 for wake-behind-a-sailing-ship data.~~

[0010] The amount of [ 60 ] setting control unit minds input/output port 71B, i. e., an I/O portion, for a necessary operation input, for example. The processing condition for being the control panel which has arranged parts for a control unit, such as an operation key for giving the cruise Data Processing Division portion 70, and acquiring necessary cruise related information by the cruise Data Processing Division portion 70, It is a part for the control unit which sets up the display condition for displaying necessary cruise related conditions on the display screen 81 of the display-processing portion 80. For example, each operation key for setting up or changing a display, elimination, etc. of a display and elimination of a display measure besides the taking-in conditions of the data of the above self-ship position 10a and latitude meridian lines, movement and zooming of a display rectangle, and a map is prepared.

[0011] The memory 73 for work which memorizes the setting data based on the setpoint signal 60a which took in the cruise Data Processing Division section

portion 70 from input/output port 71B, data required on the process of control processing, etc., The above-mentioned memory 74 for wake-behind-a-sailing-ship data, and the map data memory 75 which memorizes the map data for displaying a map, Each necessary data is taken in from the memory 72 for processing which memorized fixed figures, such as the clock circuit 76, and a mark, a menu for obtaining time data, and the the data of the screen element. The data of the cruise related information acquired by the program of the control processing flow memorized in the memory 72 for processing performing necessary processing is memorized in the memory 73 for work. In addition, the ~~depth-lines Ld, such as coastline M1, etc. are contained in map data. And~~ ~~\*\*\*\*\* Ld is also called the isobath or the depth line.~~

[0012] The data of the cruise related information memorized in the memory 73 for work is given to the display-processing portion 80 if needed with the data of the cruise related information memorized by the memory 74 for wake-behind-a-sailing-ship data, and the data of the cruise related information memorized by the memory 75 for map data.

[0013] The data of the picture element for drawing with which CPU80A was memorized by the picture element memory 82 in the display-processing portion 80 in the data of each cruise related information given from the Data Processing Division portion 70, Like [ process / based on the program of the processing flow for control processing memorized in the memory 83 for processing ] the picture of the cruise related information made into the purpose, for example, ~~drawing 16 Figures, such as the depth lines Ld, such as self-ship wake-behind-a-sailing-ship CR1, plan route RT1,~~ destination point JP1, the coastline M1, and latitude LX and meridian-lines LY-, the self-ship position 10a -- the numeric value of degree of - self-vessel speed 10b, direction of present progressive 10c, and destination point JP1. While memorizing serially the data showing the text TT, such as a numeric value of the difference angle theta 1 of the direction of movement 10c and plan route RT1, of a picture in the memory 84 for the display screens, making it update, the memory content of the memory 84 for the display screens is read, and it displays on the display screen 81.

[0014] In addition, the thing which displays the portion which displays the text TT on the proper corner part of the display screen 81 like drawing 16, What is displayed on the portion covering two or more [ two or more / 1// of the whole / of the width BB of the display screen 81 ], for example, about 1/4 lengthwise directions, at either of the right and left of the display screen 81, What is displayed on the portion covering two or more [ two or more / height HB / 1// of the whole / of the display screen 81 ], for example, about 1/5 longitudinal directions, and the thing to display combining two or more things of these displays are in either of the upper and lower sides of the display screen 81.

[0015] Memory 75, and picture element memory 72 and the memory for processing 82 for processing And ROM, [ memory 83 and the memory for map data ] Namely, while constituting from a read only memory and constituting memory 73, and memory 74 and the memory for the display screens 84 for wake-behind-a-sailing-ship data for work from RAM, i.e., the memory in which rewriting read-out is possible The battery for storage maintenance for holding the memory content of the necessary memory of such memory (not shown) is formed, and it constitutes. In addition, if needed, a necessary memory part may be used as a flash memory, and may be constituted.

[0016] In drawing 13, the display screens 81 are the display screens, such as a drop with the screen by a raster scan, for example, a Braun-tube drop, and a dot-matrix type liquid crystal display machine, and each figure of the picture to display is generated as follows, and they show it.

[0017] The picture of self-ship wake-behind-a-sailing-ship CR1 connects the every place point of the data of the self-ship position 10a of the past memorized by the memory 74 for wake-behind-a-sailing-ship data, and the data of the present self-ship position 10a with the picture element for drawing memorized by the picture element memory 82, uses it as the figure of one wake-behind-a-

ways

~~sailing-ship line, and is displayed.~~ In addition, it can be carried out whether self-ship wake-behind-a-sailing-ship CR2 at the time of the past voyage, i.e., past wake-behind-a-sailing-ship CR2, change the kind of line, or a color is changed like a postscript, and can also display.

[0018] The point of two or more direction changed parts P1-P4 is connected with the picture element for drawing memorized by the picture element memory 82, the route to destination point JP1 is used as the figure of the route lines L1-L5 of the shape of a series of polygonal line, and the picture of plan route RT1 displays it.

[0019] Moreover, without setting up the point of the direction changed parts P1-P4, only destination point JP1 can be set up, and it can also constitute so that the figure of ~~only one straight line which~~ connects the self-ship position 10a in the time of performing the setup and destination point JP1 may be displayed. In addition, the direction changed parts P1-P4 are also called veering point.

[0020] The picture of the depth lines Ld, such as coastline M1-, connects the point of the fine interval memorized by the memory 75 for map data with the picture element for drawing memorized by the picture element memory 82, for example, ~~uses it as the figure of the depth lines Ld, such as a series of coastline M1, and is displayed every [every water depth predetermined value which defined beforehand, for example, 100m, in addition,] -- etc. -- it is the depth line Ld.~~

[0021] The conditions which the picture of latitude LX and meridian lines LY defined beforehand, Or the number and interval by the conditions set up with the after-mentioned menu screen, for example, the horizontal line and vertical line covering the whole screen by the picture element for drawing memorized by the picture element memory 82 in the part of the point which calculated Latitude LX according to the conditions which make 2 and meridian lines LY three and make an interval the integral value of "" of latitude longitude, or "" -- for example, The figure made into the horizontal line and vertical line by a solid line is displayed.

[0022] [ cursor CLX-CLY in which movement for specifying the arbitrary points CP on the display screen 81 is possible ] The figure which made the part of the designated point CP which moves by the operation input from a part for the setting control unit 60 in the display screen 81 top the horizontal line and vertical line covering the whole screen, for example, the horizontal line and vertical line by a dotted line, with the picture element for drawing is displayed. In addition, cursor CLX-CLY may be changed into a figure with small + character figure, x character figure, etc., and the intersection portion of these figures may be displayed as a point CP.

[0023] Specifically, a part for the setting control unit 60 is constituted so that the input by the operation key which consists of contact operation keys by which a contact is closed, for example only while operating it, and operated each operation key may be changed into the signal of a predetermined sign in input/output port 71B and it may give a predetermined portion.

[0024] and [ in the case of the color display which classifies each cruise related information by color, and was displayed ] for example, drawing 15 -- like -- a part for setting control units, such as screen selection operation partial 61 and a destination, -- it constitutes from a part for control unit part 67 and the arbitrary directional movement control units 68, such as setting control unit part, such as 62, wake-behind-a-sailing-ship setting control unit part 63, mark setting control unit part 64, and numeric value, 65, screen setting control unit part 66, and a power supply, etc.

[0025] In the composition for the setting control unit 60 of drawing 15, the screen selection operation portion 61 is a part for the control unit which mainly chooses the display form of the display image of the cruise related information displayed on the display screen 81, and the "wake-behind-a-sailing-ship" key key "navigation" key "monitor" key "menu" etc. is prepared.

[0026] A "wake-behind-a-sailing-ship" key is an operation key which chooses

the wake behind a sailing ship of a self-ship as the displaying condition made into a subject, for example, the displaying condition of drawing 16.

"Navigation" key is an operation key chosen as the displaying condition which makes navigation of a self-ship a subject. A "monitor" key is an operation key chosen as the state which displays cruise related information only in written form, and supervises it, i.e., a monitor state. A "menu" key is an operation key chosen as the displaying condition which displays the menu screen which sets up each details of the display conditions of cruise related information.

[0027] The amount of [ 62 ] setting control units, such as a destination, are parts for the control unit which mainly choose the display form relevant to the destination of the cruise related information displayed on the display screen 81 etc., and the "destination" key key "destination" key "root" key "alarm" etc. is prepared.

[0028] A "destination" key is an operation key made into the displaying condition which performs registration which attaches and memorizes to the destination set up while setting up the destination point made into the terminal point of a cruise, for example, destination point JP1 of drawing 16, predetermined sign, for example, destination number.

[0029] A "destination" key is an operation key which makes any one of the destinations registered by operation by a "destination" key the displaying condition chosen as a destination. A "root" key is an operation key made into the plan route to a destination point, for example, plan route RT1 of drawing 16, i.e., the displaying condition which performs a setup of the root.

[0030] An "alarm" key is an operation key made into the displaying condition which sets up the alarm condition which generates alarms, such as having arrived at the point of predetermined distance, from predetermined point, for example, destination point JPof drawing 16, 1.

[0031] The amount of [ 63 ] wake-behind-a-sailing-ship setting control unit is a part for the control unit which mainly chooses the display form relevant to the wake behind a sailing ship of the cruise related information displayed on the display screen 81 etc., and the "map" key key "color" key "elimination" key "\*\*\*" etc. is prepared.

[0032] A "map" key is an operation key which chooses a display and un-displaying of a map in the displaying condition of a wake-behind-a-sailing-ship display. A "color" key is the figure of a wake behind a sailing ship, for example, the operation key which chooses each foreground color to self-ship wake-behind-a-sailing-ship CR1 and past wake-behind-a-sailing-ship CR2 of drawing 16.

[0033] In addition, selection of the foreground color is constituted so that the number corresponding to each color which operated the "color" key, displayed the screen of the "color" selection menu, and was displayed on the "color" selection menu may be chosen by several character each key of after-mentioned "0" - "9."

[0034] "Elimination" key is an operation key which eliminates temporarily the picture of a route, for example, the picture of self-ship wake-behind-a-sailing-ship CR1 and past wake-behind-a-sailing-ship CR2 of drawing 16. \*\* / "\*\*\*" key is selection of the interval value of the interval which takes the data of the self-ship position 10a into the memory 74 for wake-behind-a-sailing-ship data, and an operation key which switches the taking in, ON state, i.e., a "\*\*\*" state, and an OFF state, i.e., a "\*\*\*" state, in order to draw a wake behind a sailing ship.

[0035] [ in addition, the interval value of the interval which takes the data of the self-ship position 10a into the memory 74 for wake-behind-a-sailing-ship data in the "\*\*\*" state by \*\* / "\*\*\*" key ] the menu screen by the above-mentioned "menu" key -- a predetermined time interval -- for example, -- "-- it takes into every 20-second" -- as -- a distance interval predetermined in set \*\*\*\*, for example, movement, -- "-- it can be set up to take into every 100m."

[0036] The displaying condition of a wake-behind-a-sailing-ship display says the displaying condition which can perform a wake-behind-a-sailing-ship display here, and the displaying condition which has eliminated the picture of a wake behind a sailing ship is included as mentioned above.

[0037] A part for the mark setting control unit 64 is set mainly to the displaying condition of a wake-behind-a-sailing-ship display. The point 10a of a law, for example, the self-ship position of drawing 16, everywhere which accompanies cruise related information It is a part for the control unit which chooses the figure and color of the mark which displays consideration point EV1, EV2, etc. which performed destination point JP1 and the matter which should mind, for example, fish catching etc., and the "color" key key "O" key "\*\*\*" key "\*\*\*" etc. is prepared.

[0038] It is the operation key which performs selection soot \*\*\*\*\*, and selection of each foreground color chooses each foreground color for a "color" key to distinguish each mark figure to plurality further by the same operation as the "color" selection in a part for the wake-behind-a-sailing-ship setting control unit 63. The "O" key key "\*\*\*" key "\*\*\*" is operating the key of either of these, and chooses the operated figure of a key as a mark.

[0039] In addition, he is trying to unrelated always display these marks on "expansion" and "reduction" of the picture to display in a fixed size. Moreover, the mark which displays point EV1, EV2, etc. which performed the above-mentioned matter which should mind, for example, fish catching etc., is called event mark.

[0040] Mainly in the displaying condition of a menu screen, it is a part for the control unit which performs operation which inputs a necessary numeric value or chooses a necessary item, for example, the kind of "color" etc., and, as for a part for the setting control units 65, such as a numeric value, each sign key of several character each key [ of "0" - "9" ] - "+" and "-" etc. is prepared.

[0041] The amount of [ 66 ] screen setting control unit is a part for the control unit which operates change of the measure of a screen, a scroll, etc. mainly in the displaying condition of a wake-behind-a-sailing-ship display, and the "central" key key "\*\*\*" key "\*\*\*" key "->" key "<-" key "expansion" key "reduction" etc. is prepared.

[0042] A "central" key is an operation key which makes the self-ship position 10a the displaying condition positioned in the center of the screen of the display screen 81. "Expansion" key, i.e., the operation key which attached the arrow suitable for four slanting outsides, is an operation key to which the screen currently displayed is expanded in the shape of zoom. "Reduction" key, i.e., the operation key which attached the arrow suitable for four slanting inner sides, is an operation key which reduces the screen currently displayed in the shape of zoom.

[0043] [ the "\*\*\*" key key "\*\*\*" key "->" key "<-" ] While displaying cursor by the after-mentioned "cursor" key It operates as an operation key which moves the intersection CP of cursor CLX-CLY, i.e., a designated point, to either above, down, the left and the right which corresponds in the direction of an arrow. While not displaying cursor, it operates as an operation key which moves the whole screen to either above, down, the left and the right which corresponds in the direction of an arrow.

[0044] The amount of [ 67 ] control units, such as a power supply, are mainly parts for the control unit which perform adjustment of ON-OFF of the power supply of equipment, and the brightness of the display screen 81, and the "power supply" key key "brightness" etc. is prepared.

[0045] The "power supply" key 67A is an operation key which performs ON-OFF, i.e., the operation supplied or intercepted, for the power supply of equipment. A "brightness" key is an operation key which performs operation of changing the brightness of the display screen.

[0046] The amount of [ 68 ] arbitrary directional movement control unit is a part for the control unit which performs operation which moves the whole screen



currently displayed or cursor CLX-CLY in the arbitrary directions, for example, it consists of a track ball, a joystick, etc.

[0047] While [ and ] displaying cursor by the after-mentioned "cursor" key While operating as an operation key which moves the intersection CP of cursor CLX-CLY, i.e., a designated point, in the arbitrary directions and not displaying cursor, it operates as an operation key which moves in the arbitrary directions in the whole screen.

[0048] The amount of [ 69 ] setting control units, such as cursor, are parts for the control unit which mainly operate determination or cancellation of a condition and a numeric value chosen or inputted as a display and un-displaying of cursor, and the trend of the display screen, and the "cursor" key key "navigation change" key "determination" key "cancellation" etc. is prepared.

[0049] Whenever it carries out the key stroke of the "cursor" key, it is an operation key which switches cursor CLX-CLY to a displaying condition and a non-displaying condition every. "A display for north directions" which displays a display image every by making the right above [ the display screen 81 ] direction into "those for north directions" whenever it carries out the key stroke of the "navigation change" key, It is the operation key switched to the "direction display of a bow" which displays a display image by making the right above [ the display screen 81 ] direction into "the direction of a bow", and the "direction display of a destination point" which displays a display image for the right above [ the display screen 81 ] direction as "a direction of destination point JP1."

[0050] "Determination" key is an operation key "opts" for making it operate by the condition and numeric value which operated other operation keys, and chose or inputted them. "Cancellation" key is an operation key which cancels the above-mentioned condition and numeric value.

[0051] It replaces with a part for the setting control unit 60 of above drawing 15, and there is also a thing of composition of positioning a part for a setting control unit 60 like drawing 17 under the display screen 81, and preparing it. And only the "menu" key in the screen selection operation portion 61 of drawing 15 is arranged to a part for the setting control units 62X, such as a destination of drawing 17, and the operation by other keys consists of composition of drawing 17 so that selection operation may be carried out in the menu screen by the "menu" key 62A.

[0052] Moreover, only operation by the "destinations" key in a part for the setting control unit 62 is arranged to a part for the setting control units 62X, such as a destination of drawing 17. [ , such as a destination of drawing 15 , ] The operation by other keys is changed so that selection operation may be carried out in the menu screen by the "menu" key 62A, and all operations in a part for the setting control units 65, such as a numeric value of drawing 15, are constituted so that selection operation may be carried out in the menu screen by the "menu" key 62A.

[0053] A part for the screen setting control unit 66 of drawing 15 like [ for the screen setting control unit / 66X / of drawing 17 ] The moving operation by "\*\*\*" key key "\*\*\*" key [ of drawing 15 ] "->" - "<-" is removed. In addition to the same "expansion" key 66Dand "center" key 66Eand "reduction" key 66F as drawing 15, it has newly changed so that "scale 1" key 66Aand "scale 2" key 66Band "scale 3" Key 66C may be formed.

[0054] In addition, beforehand, the measure by "scale 1" key 66Aand "scale 2" key 66Band "scale 3" Key 66C is constituted so that it can set up in the menu screen by the "menu" key 62A.

[0055] While changing a part for the wake-behind-a-sailing-ship setting control unit 63 of drawing 15 like [ for the wake-behind-a-sailing-ship setting control unit / 63X / of drawing 17 ] so that selection operation of the operation by the "map" key of drawing 15 may be carried out in the menu screen by the "menu"

key 62A It constitutes so that selection by the "color" key and a menu screen can be directly chosen by the "wake-behind-a-sailing-ship color" change-over switch 63A of drawing 17 .

[0056] Furthermore, to \*\* / "\*\*\*" key 63D, and "wake-behind-a-sailing-ship elimination" the key 63F of the same wake behind a sailing ship as drawing 15 [ with in addition "storage" key 63Band "a call" the key 63C of drawing 17 ]

Directly, a menu screen is displayed, and operation of attaching and memorizing a sign to the wake behind a sailing ship in the time, and operation of calling the memorized wake behind a sailing ship are constituted so that it can be operated on a menu screen.

[0057] A part for the mark setting control unit 64 of drawing 15 like [ for the mark setting control unit / 64X / of drawing 17 ] While arranging the "\*\*\*" key 64F which has arranged the "x" key 64E in addition to the same "O" key 64Band "\*\*\*" key 64C as drawing 15 , and used the "\*\*\*" key of drawing 17 as the reverse triangle figure It changes so that selection by the "color" key and a menu screen can be directly chosen by the "mark" change-over switch 64A of drawing 17 , and it constitutes so that the mark which arranges and specified "mark elimination" 64F can be eliminated further.

[0058] moreover, [ the destination of drawing 17 etc. / a part for the setting control unit 62X ] In addition to above-mentioned "menu" key 62Aand "destination" key 62Band "cursor" key 62H, and the same "cancellation" key 62Dand "determination" key 62F[ same ] and "navigation change" key 62G as drawing 15 , "\*\*\*\*\*" key 62Cand "return" key 62Jand "release" key 62E are added.

[0059] The "\*\*\*\*\*" key 62C memorizes the self-ship position 10a of the point from which the self-ship took down the anchor, and a self-ship [ with a billow, a current, etc. ] From the point, use the distance, the direction, etc. which moved for displaying, and [ the "return" key 62J ] After carrying out moving operation of the screen currently displayed on the display screen 81, it uses for making it return to the displaying condition in the original position, and "release" key 62E is used for canceling a display, setup, etc. of a menu screen, the destination, and \*\*\*\*.

[0060] In addition, a part for the arbitrary directional movement control unit 68 of drawing 17 is constituted from a joy stick type operation machine, and all of a screen, the moving operation of cursor, or the selection operation in a menu screen are constituted so that a part for the arbitrary directional movement control unit 68 may perform.

[0061] Furthermore, in above-mentioned drawing 13 - the composition of drawing 17 if needed as the dotted line showed to drawing 13 The composition (henceforth the 2nd conventional technology) which form the file memory portion 90 and its input/output port 91, take necessary data into the interior of equipment from the exterior, and memorize it, or the file memory portion 90, for example, an IC card, is made to memorize the data inside equipment, and is saved is common knowledge.

[0062] And while in the former composition removing the memory 75 for map data, making the file memory portion 90 into the IC card which memorized map data beforehand for example, and constituting By preparing and constituting the storage reading function of an IC card in input/output port 91, it constitutes so that map data may be read in the file memory portion 90 and may be displayed.

[0063] Moreover, while in the latter composition making it the IC card which memorizes the indicative data of the display screen [ in / for the file memory portion 90 / a wake-behind-a-sailing-ship displaying condition ] 81 for example, and constituting While saving the cruise related information in the past wake-behind-a-sailing-ship displaying condition by preparing and constituting the storage writing and read-out function of an IC card in input/output port 91, it constitutes if needed so that the past wake-behind-a-sailing-ship displaying condition may be indicated by reappearance.

[0064] Although displayed by the text TT with the [course gap display composition] of above-mentioned drawing 16 by considering the navigation state of a self-ship over plan route RT1 as the course gap theta 1 [ replace with the display of a such course gap and ] like the [distance width gap display composition] of drawing 16 The portion of the predetermined distance width B1, for example, the width of 100m each of right and left, centering on plan route RT1 is made into the predetermined route range, and there are some which were constituted so that the self-ship position 10a might display distance width B1a beyond the distance width B1 as an amount of course gaps.

[0065] Moreover, the composition (henceforth the 3rd conventional technology) which made one a part for the arithmetic part which obtains the data of the predetermined part 10c of the position measurement portion 10 in the above-mentioned 1st conventional technology and 2nd conventional technology, for example, self-ship position 10a, degree of self-vessel speed 10b, and the direction of a present progressive, and the cruise related information display 20 is common knowledge.

[0066] in addition, [ the electric navigation equipment by satellite electric navigation, for example, GPS (Global PositioningSystem) electric navigation, ] Above-mentioned degree of self-vessel speed 10b and direction 10c of a present progressive are measured based on the amount of Doppler shift of the frequency of the satellite electric wave from two or more move satellites around gone at the rate of 2 rounds/the degree of schedule. The composition of the amendment navigation which amends the error by change of the propagation property in an altitude radio-wave-propagation way etc., and raises measurement precision further is common knowledge.

[0067] Electric navigation equipment according to DGPS (Differential Global Positioning System) for example as such amendment navigation, The electric navigation equipment by WAAS/GPS (GPS augmented with the WideArea Augmentation System) is common knowledge, and these are called "amendment satellite electric navigation equipment" in this invention.

[0068] and [ the composition (henceforth the 4th conventional technology) of the amendment satellite electric navigation equipment by DGPS ] the error value of the position value 10a measured in the office of two or more dispersed measurement points, for example, a coast station, and the actual position value of the measurement point -- a basis -- [ the correction value of the amount data of Doppler shift based on \*\*\*\*\* each satellite / it transmits through radio and ] By amending the amount data of Doppler shift based on each satellite by the correction value obtained by receiving the transmitted electric wave of one station near the current position of a self-ship, it constitutes so that the precision of self-ship position 10a, degree of self-vessel speed 10b, and the direction 10c of a present progressive may be raised.

[0069] [ moreover, the composition (henceforth the 5th conventional technology) of the amendment satellite electric navigation equipment by WAAS/ GPS ] Similitude carries out an electric wave to two or more satellite electric waves which measure each correction value which received and memorized the electric wave of the correction value from each office which distributed and prepared the coast station in above DGPS, and two or more offices which measure the same correction value by the geostationary satellite prepared separately from the above-mentioned move satellite gone around, and it transmits. By carrying out the same amendment as the case of above DGPS by the correction value obtained by receiving this electric wave, it constitutes so that the precision of self-ship position 10a, degree of self-vessel speed 10b, and the direction 10c of a present progressive may be raised.

[0070] Although the move satellite around gone as a satellite for measurement is used with the composition of the satellite electric navigation by the above-mentioned 1st conventional technology - the 5th conventional technology The composition (henceforth the 6th conventional technology) which replaces with such a move satellite and acquires self-ship position 10a, degree of self-vessel

speed 10b, and the direction 10c of a present progressive with the electric navigation using a geostationary satellite is also common knowledge.

[0071] [ degree of self-vessel speed 10b and the direction 10c of a present progressive acquired by each above electric navigation equipment ] The degree 10b of self-vessel speed [ a low speed, for example, speed of 5 knots or less, ] since precision worsens, as the dotted line showed to drawing 13 , boil the heading measurement portion 15, for example, a gyrocompass, a magnetic compass, etc. -- while constituting so that it may acquire, the direction 15a of a bow of the present bow, i.e., direction, of the \*\*\*\*\* present In below the predetermined degree 10b of self-vessel speed, it replaces with in the direction 10c of a present progressive, and the composition (henceforth the 7th conventional technology) using the direction 15a of the present bow is common knowledge.

[0072] Furthermore, it adds to the composition of the above-mentioned 1st conventional technology - the 7th conventional technology like drawing 18 and drawing 19 . Prepare the water depth measurement portion by the water depth measurement portion 30, for example, echo-sounding equipment, or a shoal-of-fish detection device, and the water depth data of 30a obtained in the water depth measurement portion 30 is taken into the water depth memory 77 for data through input/output port 15a. While making the data of each depth of water 30a, and the self-ship position 10a where the depth of water was obtained correspond and memorizing them, the composition (henceforth the 8th conventional technology) which reads the memory content and displayed the figure of the sea bed cross section by the side of back from the self-ship position 10a in self-ship wake-behind-a-sailing-ship CR1 of drawing 16 is common knowledge.

[0073] In drawing 19 , constitute the water depth measurement portion 30 from a shoal-of-fish detection device, and the sending signal from the transmitting portion (not shown) of the acoustic wave formed in the interior is underwater transmitted from the transducer 35 formed in the ship's bottom of the self-ship etc. By processing the signal amplified by the amplification portion (not shown) which amplifies the received signal acquired by receiving the reflected wave obtained from a shoal of fish, a sea bed, etc. with the transducer 35 to necessary signal strength by water depth Data Processing Division portion and display-processing portion (not shown), like the display screen 31 of drawing 19 It constitutes so that the shoal-of-fish detection display image 31a with a shoal of fish and the picture of a sea bed can be displayed.

[0074] And it constitutes so that the data of the depth of water which is equivalent to the water depth portion of 31a now [ of the shoal-of-fish detection display image 31a ] may make it correspond through the input/output port 71A of drawing 18 as the present water depth 30a with the self-ship position 10a where the water depth 30a was obtained and may memorize in the water depth memory 77 for data.

[0075] In addition, it cannot be overemphasized that a part for each control unit required for shoal-of-fish detection and water depth measurement is prepared in the water depth measurement portion 30 32 in this composition, a part for i.e., the setting control unit of a shoal-of-fish detection device.

[0076] Therefore, the data of the self-ship position 10a for every predetermined time Or while constituting so that it may take in for every predetermined distance and self-ship wake-behind-a-sailing-ship CR1 may be created The figure of the above-mentioned sea bed cross section which formed the picture of the sea bed in the shoal-of-fish detection display image 31a in the figure of the letter of a crease can be displayed by taking the water depth data of 30a into every self-ship position 10a of the, and memorizing in the water depth memory 77 for data.

[0077] In addition, in composition of displaying this sea bed cross section, it constitutes so that the operation part for displaying a sea bed cross section may

be established in the proper part for the setting control unit 60 of drawing 15 and drawing 17 or the selection operation part for displaying a sea bed cross section may be established into a proper menu screen.

[0078] Moreover, the composition (henceforth the 9th conventional technology) which replaces the water depth measurement portion 30 in the composition of the 8th conventional technology of above-mentioned drawing 19 with a shoal-of-fish detection device, and forms echo-sounding equipment is also common knowledge.

[0079] And echo-sounding equipment is constituted so that a part for the display which constitutes, for example, without displaying the above-mentioned shoal-of-fish detection picture 31a so that water depth 31a may be outputted only as the present water depth 30a now [ above-mentioned ], and carries out character representation of the water depth 30a if needed may be prepared.

[0080] The composition (henceforth the 10th conventional technology) which prepared the portion except the transducer 35 of such echo-sounding equipment and the portion attached to it in the interior for a cruise related information 20 display is also common knowledge.

[0081] Furthermore, the composition of composition (henceforth the 11th conventional technology) of having made a part for the water depth measurement portion 30 in the composition of drawing 19, for example, the water depth measurement portion by a shoal-of-fish detection device, and the cruise related information display 20 into one body is common knowledge like drawing 20 and drawing 21.

[0082] In drawing 20, a cruise related information display part + depth-sounding measurement portion (20+30) is a portion which made one body a part for the water depth measurement portion 30 by the shoal-of-fish detection device of drawing 19, and the cruise related information display 20.

[0083] Moreover, the amount of (60+32) setting control unit makes a part for a part for the setting control unit 60 of drawing 19, and the setting control unit 32 into one body, and [ with operation for a setting control unit (60+32) ] It constitutes so that a cruise related information display image like drawing 16 and a shoal-of-fish detection display image like drawing 19 may be displayed on the display screen (81+31) in parallel, only a cruise related information display image may be displayed on it or only a shoal-of-fish detection display image may be displayed on it like drawing 20.

[0084] In addition, [ a part ] like drawing 21 although a part for a setting control unit (60+32) is constituted in the operated-by remote control type by wireless communications, such as an operated-by remote control type by cable splicing, or infrared transmission An operation part required in order to perform shoal-of-fish detection to a part for the setting control unit 60 by the composition of drawing 15 or drawing 17 is established, and it constitutes.

[0085] In drawing 21, the key to which the character sign the same as that of the character sign given to each key of drawing 15 and drawing 17 or similar is given is an operation key for making image display the same as that of the character sign given to each key of drawing 10 and drawing 12, or similar perform.

[0086] an operation key for "sensitivity" key to fluctuate the receiving sensitivity of shoal-of-fish detection -- "-- sounding -- an operation key for a range" key to set up the range which detects a shoal of fish and a sea bed -- An operation key for a "plotter" key to choose and display only a cruise related information display image like drawing 16 and a "\*\*\*\*\*" key are operation keys for choosing and displaying only a shoal-of-fish detection display image like drawing 19.

[0087] Moreover, PU / "fish" key is operation keys for displaying a cruise related information display image like drawing 16, and a shoal-of-fish detection display image like drawing 19 in parallel. When a "graph" key is a key for

choosing and displaying either of a water temperature graph and a sea bed graph, a "graph" key is operated and a water temperature graph is chosen. When the water temperature detected with the water temperature detector (not shown) attached to the transducer 35 is made into the shape of a line graph, and is displayed and a sea bed graph is chosen, the sea bed cross section in the composition of the above-mentioned 8th conventional technology and the sea bed cross section of the shape of same line graph are displayed.

[0088]

[Problem to be solved by the invention] The [1st technical problem] According to the composition of the above-mentioned 8th conventional technology and 11th conventional technology, the water depth position of 30a made into the purpose can be known by displaying the figure of a back sea bed cross section from the self-ship position 10a.

[0089] When [ and ] memorizing the wake-behind-a-sailing-ship data of self-ship wake-behind-a-sailing-ship CR1 in the memory 74 for wake-behind-a-sailing-ship data. If the data of the self-ship position 10a used as wake-behind-a-sailing-ship data and the water depth data of 30a are made to correspond, it memorizes in the water depth memory 77 for data and past wake-behind-a-sailing-ship CR2 are displayed based on this memory content. At the time of a next cruise, distance until it arrives at a front water depth situation and the water depth ocean space of 30a made into the purpose rather than the self-ship position 10a etc. can be known by following the past wake-behind-a-sailing-ship CR2.

[0090] However, with such composition, in cruising ocean space without past wake-behind-a-sailing-ship CR2, there is un-arranging [ that distance until it arrives at a front water depth situation and the water depth ocean space of 30a made into the purpose rather than the self-ship position 10a etc. cannot be known ].

[0091] The [2nd technical problem] With the composition of the above-mentioned 1st conventional technology - the 11th conventional technology, since \*\*\*\*\* Ld is displayed with the map data memorized by the memory 75 for map data, or the file memory portion 90, the ocean space where a self-ship cruises, or the ocean space of the depth of water made into the purpose can be known.

[0092] furthermore, the depth of the ocean space made into depth required as a self-ship, for example, a fishery, although not contained in map data etc. -- etc. -- if there is a depth line, it is convenient very much. And since the depth lines Ld, such as map data, are what the public organization tied the water depth data which measured the depth of water of the every place point of having divided ocean space in the shape of [ fine ] a grid, and created the point of depth, such as structure, if the same work is done by self-ship, they can make depth, such as necessary.

[0093] However, a depth line makes having carried out like this etc., and there is un-arranging [ of \*\*\*\*\* needing whether to be the size for it and needing a considerable investment etc. ] in a direction. For this reason, the technical problem that offer of such an inconvenient navigation equipment which is not is desired occurs.

[0094]

[Means for solving problem] This invention the picture of the cruise related information containing the self-ship wake behind a sailing ship which includes the above self-ship positions to the above-mentioned [1st technical problem], the direction of movement of the present self-ship or the direction of a bow, and a depth line, such as plurality, in the navigation equipment it enabled it to display on the display screen [0095] The 1st composition which establishes a sea bed cross-section display means to display the picture of the sea bed cross section by the side of the front in an above-mentioned direction of movement or the above-mentioned direction of a bow on the above-mentioned display screen, based on each depth-sounding data corresponding to the every place point for

displaying a depth line, such as the above-mentioned plurality, and [0096] The 2nd composition which changes a part of picture of the above-mentioned cruise related information into the picture of the above-mentioned sea bed cross section, or replaces with the whole picture of the above-mentioned navigation related information, and displayed the picture of the above-mentioned sea bed cross section in this 1st composition only when predetermined operation was performed, and [0097] The 3rd composition which displayed the picture of the above-mentioned sea bed cross section covering the range of a predetermined distance from the above self-ship position in the 1st above-mentioned composition and 2nd composition, and [0098] The 4th composition which constituted the above-mentioned position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment in the 1st above-mentioned composition - the 3rd composition, and [0099] The 5th composition which used each depth-sounding data based on depth lines, such as the above contained in the map data memorized beforehand as each above-mentioned depth-sounding data in the 1st above-mentioned composition - the 3rd composition, and each depth-sounding data obtained by the water depth measurement portion, and [0100] In the 5th above-mentioned composition, while constituting the above-mentioned position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment, it solves by the 6th composition which constituted the above-mentioned water depth measurement portion from a shoal-of-fish detection device.

[0101] Moreover, the position measurement data of the self-ship position obtained by the above position measurement portions to the above-mentioned [2nd technical problem], [0102] being based on the water depth measurement data of the water depth value corresponding to the above self-ship position obtained by a water depth measurement portion -- etc. -- [ the picture of the cruise related information containing a depth line ] in the navigation equipment it enabled it to display on the display screen While setting up the water depth predetermined value for creating depth lines, such as the above The 1st storage portion which memorizes the predetermined depth-sounding position value corresponding to the above-mentioned water depth predetermined value is prepared. A predetermined depth-sounding position value storage means to memorize the position value of the above-mentioned position measurement data at the time of the above-mentioned water depth measurement data becoming the above-mentioned water depth predetermined value into the 1st above-mentioned storage portion as the above-mentioned predetermined depth-sounding position value, and [0103] A segment storage means to memorize the segment prepared data for creating the segment which connects between the points of the above-mentioned predetermined depth-sounding position value memorized into the 1st above-mentioned storage portion into the 2nd storage portion, The 7th composition which establishes a depth line display means, such as displaying depth lines, such as the above, on the above-mentioned display screen based on each data obtained by reading each memory content of the 1st above-mentioned storage portion and the 2nd above-mentioned storage portion, and [0104] While setting it as a different water depth value from the water depth value of depth lines, such as a depth line, i.e., a map etc., such as being contained in the map data which memorized the above-mentioned water depth predetermined value beforehand in this 7th composition, and creating depth lines, such as the above The 8th composition which added a merge display means to merge and display depth lines, such as the above, and depth lines, such as the above-mentioned map, and [0105] While making the above-mentioned water depth predetermined value into two or more water depth predetermined values and setting it up in the 7th above-mentioned composition and 8th composition The 9th composition which displayed depth lines, such as two or more above, on the above-mentioned display screen by preparing the storage portion corresponding to two or more above-mentioned water depth predetermined values in the 1st above-

mentioned storage portion and the 2nd above-mentioned storage portion, and [0106] The 10th composition which added a segment elimination addition means to have specified the figure or the above-mentioned segment which displays the above-mentioned point in the 7th above-mentioned composition - the 9th composition, and to have eliminated storage of the above-mentioned segment prepared data, or to add storage of the above-mentioned segment prepared data, and [0107] The 11th composition which constituted the above-mentioned water depth measurement portion from a shoal-of-fish detection device in the 7th above-mentioned composition - the 10th composition while constituting the above-mentioned position measurement portion from satellite electric navigation equipment or amendment electric navigation equipment, and [0108] [0109] being based on the position measurement data of the self-ship position obtained by a position measurement portion, and the water depth measurement data of the water depth value corresponding to the above self-ship position obtained by a water depth measurement portion -- etc. -- [ the picture of the cruise related information containing a depth line ] in the navigation equipment it enabled it to display on the display screen While setting up the water depth predetermined value for creating depth lines, such as the above The 1st storage portion which memorizes the predetermined depth-sounding position value corresponding to the above-mentioned water depth predetermined value is prepared. A predetermined depth-sounding position value storage means to memorize the position value of the above-mentioned position measurement data at the time of the above-mentioned water depth measurement data becoming the above-mentioned water depth predetermined value into the 1st above-mentioned storage portion as the above-mentioned predetermined depth-sounding position value, and [0110] A segment storage means to memorize the segment prepared data with which between the points of the predetermined depth-sounding position value memorized into the 1st above-mentioned storage portion creates the segment which connects between the following [ a predetermined distance value ] into the 2nd storage portion, and [0111] The 12th composition which establishes a depth line display means, such as displaying depth lines, such as the above, on the above-mentioned display screen based on each data obtained by reading each memory content of the 1st above-mentioned storage portion and the 2nd above-mentioned storage portion, and [0112] The 13th composition which displayed the figure which displays the point which is not connected by the above-mentioned segment while displaying the figure which displays the point connected by the above-mentioned segment in this 12th composition with a small figure with the large figure, and [0113] While expressing the figure which displays the point connected by the above-mentioned segment in the 12th above-mentioned composition and 13th composition as regular brightness The figure which displays the point which is not connected by the above-mentioned segment Brightness brighter than regular brightness or the 14th composition which is blinked and was displayed, and [0114] While setting it as a different water depth value from the water depth value of depth lines, such as a depth line, i.e., a map etc., such as being contained in the map data which memorized the above-mentioned water depth predetermined value beforehand in the 12th above-mentioned composition - the 14th composition, and creating depth lines, such as the above The 15th composition which added a merge display means to merge and display depth lines, such as the above, and depth lines, such as the above-mentioned map, and [0115] While making the above-mentioned water depth predetermined value into two or more water depth predetermined values and setting it up in the 12th above-mentioned composition - the 15th composition The 16th composition which displayed depth lines, such as two or more above, on the above-mentioned display screen by preparing the storage portion corresponding to two or more above-mentioned water depth predetermined values in the 1st above-mentioned storage portion and the 2nd above-mentioned storage portion, and [0116] The 17th composition which added a segment elimination addition means to have specified the figure or the



above-mentioned segment which displays the above-mentioned point in the 12th above-mentioned composition - the 16th composition, and to have eliminated storage of the above-mentioned segment prepared data, or to add storage of the above-mentioned segment prepared data, and [0117] In the 12th above-mentioned composition - the 17th composition, while constituting the above-mentioned position measurement portion from satellite electric navigation equipment or amendment satellite electric navigation equipment, it solves by the 18th composition which constituted the above-mentioned water depth measurement portion from a shoal-of-fish detection device.

[0118]

[Mode for carrying out the invention] The example which applied this invention to the composition of the above-mentioned 1st conventional technology - the 11th conventional technology as a form of this working of an invention is explained.

[0119]

[Working example] The [1st example] Drawing 1 - drawing 3 explain the 1st example hereafter. [ this 1st example / the composition of the 1st conventional technology explained by drawing 13 - drawing 17 - the 6th conventional technology ] A part which constitutes with the application of the composition which excepted the portion using the direction of a bow in the 1st above-mentioned composition - the 4th composition, and is different from the composition of the above-mentioned 1st conventional technology - the 6th conventional technology is the next part. In addition, there shall be no display of past wake-behind-a-sailing-ship CR2 in drawing 2.

[0120] A depth line, such as plurality contained in the map data memorized by the 1st at the memory 75 for map data, or the file memory portion 90, For example, it is the part which displayed the sea bed cross-section picture 82Y by the side of the front in the direction 10c of a present progressive, for example, the front sea bed cross-section picture of drawing 2, on the display screen 81 based on each depth-sounding data corresponding to the every place point for displaying the depth lines Ld1-Ld4, such as drawing 2.

[0121] A part for the control unit for displaying a front sea bed cross section on the 2nd at a part for the setting control unit 60, for example, only when operation which displays a front sea bed cross section on drawing 15 and drawing 17 by the "front sea bed" key 69X shown by the dotted line is performed It is the part which displayed the picture which changed a part of cruise related information picture 82X in the display screen 81 of drawing 2 into the front sea bed cross-section picture 82Y, or replaced with the above-mentioned whole navigation related information picture 82X, and expanded the above-mentioned front sea bed cross-section picture 82Y.

[0122] It is the part which displayed the picture of the portion covering the range of a predetermined distance, for example, the range of 0-1.0km of the front sea bed cross-section picture 82Y of drawing 2, for the front sea bed cross-section picture 82Y on the 3rd from the self-ship position 10a.

[0123] It is the part which constituted the position measurement portion 10 from satellite electric navigation equipment, for example, GPS electric navigation equipment, amendment satellite electric navigation equipment, i.e., DGPS electric navigation, or WAAS satellite electric navigation in the 4th.

[0124] That is, the composition of this 1st example generally Self-ship wake-behind-a-sailing-ship CR1 which includes the self-ship position 10a in the 1st, and the direction of movement 10c of a present progressive of the present self-ship, for example, direction, In the navigation equipment 100 it enabled it to display on the display screen 81, Picture 82X, for example, the cruise related information picture, of the cruise related information containing the depth lines Ld1-Ld4, such as being contained in a depth line, for example, map data, such as plurality, [0125] It is based on each depth-sounding data corresponding to the every place point for displaying the depth line Ld1-Ld4, for example, \*\*\*\*\*,

such as the above-mentioned plurality. The 1st above-mentioned composition which established a sea bed cross-section display means to display the picture 82Y of the sea bed cross section by the side of the front in the above-mentioned direction of movement 10c, for example, a front sea bed cross-section picture, on the above-mentioned display screen 81 is constituted.

[0126] moreover, only when predetermined operation is performed to the 2nd in the 1st above-mentioned composition for example, only when operation which displays a front sea bed cross section by the "front sea bed" key 69X is performed A part of picture 82X of the above-mentioned cruise related information, for example, cruise related information picture, is changed into the picture 82Y of the above-mentioned sea bed cross section, for example, a front sea bed cross-section picture. Or the 2nd above-mentioned composition which displayed the picture which replaced with the whole picture 82X of the above-mentioned navigation related information, for example, a cruise related information picture, and expanded the picture 82Y of the above-mentioned sea bed cross section, for example, a front sea bed cross-section picture, is constituted.

[0127] Furthermore, the picture of the above-mentioned sea bed cross section on the 1st composition and 2nd composition of the above [ 3rd / the ], and covering the range of a distance predetermined [ the above self-ship position 10a to ], For example, the 3rd above-mentioned composition which displayed the picture of the portion covering the range of 0-1.0km of the front sea bed cross-section picture 82Y is constituted.

[0128] To the 4th, the above-mentioned position measurement portion 10 in the 1st above-mentioned composition - the 3rd composition Moreover, satellite electric navigation equipment, for example, GPS electric navigation equipment, Or the 4th above-mentioned composition constituted from amendment satellite electric navigation equipment, i.e., DGPS electric navigation, or WAAS satellite electric navigation is constituted.

[0129] And by specifically memorizing beforehand the program of the control processing flow which removed the portions of step SP1 and step SP11 from the control processing flow of drawing 3 in the memory 72 for processing in the composition of drawing 1 , it constitutes so that the display by each above-mentioned composition can be performed.

[0130] In addition, this control processing flow is constituted as a subroutine of the main control manipulation routine for performing control processing of the whole in the cruise Data Processing Division portion 70, and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0131] [Explanation of a control processing flow] The control processing flow which removed the portions of step SP1 and step SP11 from the control processing flow of drawing 3 is explained hereafter. Therefore, a control processing flow here will be started from step SP2.

[0132] <> In step SP2, take in the data of the position measurement portion 10 10c of a present progressive, for example, the direction given from satellite electric navigation equipment, for example, 12 degrees of direction of present progressive 15' of drawing 2 , and shift to the following step SP3.

[0133] Like this 1st example here [ only in the case of satellite electric navigation equipment or amendment satellite electric navigation equipment ] When the degree 10b of self-vessel speed is below a predetermined less than speed, for example, 5 knots Since it constitutes so that the data of the direction 10c of a present progressive may not be outputted, only when the degree 10b of self-vessel speed is over a predetermined speed and the data of the direction 10c of a present progressive is obtained, it will shift to the following step SP3.

[0134] <> Distinguish whether there is a signal which performed operation which displays a front sea bed cross section by the "front sea bed" key 69X, i.e., a front sea bed cross-section display signal, in step SP3. When there is a front sea bed cross-section display signal, it shifts to the following step SP4, and

when that is not right, it returns to the predetermined step part of a main control manipulation routine.

[0135] ◇ In step SP4, it is based in the map data and the direction 10c of a present progressive which are memorized by the memory 75 for map data. Data processing of the data of the positions P21-P26 of the point that each \*\*\*\*\* Ld1 - Ld5 and the coastline M1, and the direction 10c of a present progressive of drawing 2 cross is carried out, and after taking into the memory 73 for work and memorizing, it shifts to the following step SP5.

[0136] ◇ [ step SP5 ] by calculating each distance from the self-ship position 10a to positions P21-P26 based on the data of the self-ship position 10a and positions P21-P26 Creation processing of the image data for breaking and displaying sea bed form by a line picture based on the data of each of this distance and the data of the depth value of each \*\*\*\*\* Ld1-Ld5, i.e., water depth data, like the front sea bed cross-section picture 82Y of drawing 2 , is carried out.

[0137] [ here ] so that the self-ship position 10a of the front sea bed cross-section picture 82Y, i.e., distance, (km) may be known from the part of 0 the depth before and behind the self-ship position 10a (m), and the value of distance (km) to proportional distribution etc. -- the self-ship position 10a -- being water depth -- that is, data processing of the 46 water depthm can be carried out now, for example, it can display like the lower right column of the display screen 81 like drawing 2 .

[0138] Furthermore, while taking the image data into the memory 73 for work and memorizing it, after giving the display-processing portion 80 and displaying the front sea bed cross-section picture 82Y on a part for the sea bed cross-section display 81A of drawing 2 , it shifts to the following step SP6.

[0139] In addition, the memory 78 for front sea bed data is formed, and you may make it memorize the data storage in above step SP4 and these step SP5, as the dotted line showed to drawing 2 .

[0140] Moreover, a part for the sea bed cross-section display 81A is constituted so that it may be made to move to the position where the image display of the viewing area of the direction of movement 10c of a self-ship is not checked, suitably, it may display on it and display processing may be carried out in the display-processing portion 80.

[0141] Furthermore, if needed, replace with the cruise related display screen 82X, and the front sea bed cross-section picture 82Y is displayed. Or you may constitute so that such a display and the display which prepares and displays a part for the sea bed cross-section display 81A on a proper corner like drawing 2 may be chosen with the menu screen displayed by operation of the "front sea bed" key 69X, for example.

[0142] Moreover, if needed, it constitutes so that it may set up beforehand, or it constitutes so that it may choose with a menu screen, so that the picture of a portion covering the range of a predetermined distance, for example, the range of 0-1.0km, for the front sea bed cross-section picture 82Y may be displayed from the self-ship position 10a.

[0143] ◇ Distinguish whether there is a signal which eliminates a display, i.e., a front sea bed cross-section erasing signal, about a front sea bed cross section in step SP6 by the "front sea bed" key 69X or a proper operation key. When there is a front sea bed cross-section erasing signal, it shifts to the following step SP7, and when that is not right, it returns to step SP2. In addition, in this 1st example, since step SP1 is not to be prepared, it will return to step SP2 from step SP6.

[0144] ◇ In step SP7, return to the predetermined step part of a main control manipulation routine after eliminating the front sea bed cross-section picture 82Y. That is, the portion of the cruise related information display image 82X which was hidden by the amount of [ 81A ] sea bed cross-section display, and was will be displayed on the display screen 81.

[0145] therefore, when predetermined operation, for example, the operation by

the "front sea bed" key 69X, is performed according to the composition of this 1st example since it will obtain if distance until it arrives at a front water depth situation and the water depth ocean space of 30a made into the purpose rather than the self-ship position 10a, even if it is not a case in the cruise state where past wake-behind-a-sailing-ship CR2 are followed etc. can be known, and the feature is acquired, it means that the above-mentioned [1st technical problem] was solved

[0146] The [2nd example] Drawing 1 - drawing 3 explain the 2nd example hereafter. A different part from the composition of the 1st example of the above [ the composition of this 2nd example ] is the next part.

[0147] In the 1st, like the composition of the above-mentioned 7th conventional technology, the heading measurement portion 15 For example, form the gyrocompass or the magnetic compass and [ predetermined degree 10b of self-vessel speed, at for example, the time of 5 knots or less, ] When displaying the front sea bed cross-section picture 82Y using the direction 15a of a bow acquired by the heading measurement portion 15 and exceeding the predetermined degree 10b of self-vessel speed, for example, 5 knots It is the part constituted so that the front sea bed cross-section picture 82Y might be displayed using the direction of movement 10c of a self-ship obtained by the position measurement portion 10, for example, satellite electric navigation equipment, or amendment satellite electric navigation equipment.

[0148] In order to make the above-mentioned display perform in the 2nd, it is the part constituted so that the program of the whole control processing flow of drawing 3 might be beforehand memorized in the memory 72 for processing in the composition of drawing 1 .

[0149] In addition, this control processing flow is constituted as the same subroutine as the case of the 1st above-mentioned example, and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0150] [Explanation of a control processing flow] The control processing flow of drawing 3 is explained hereafter.

◇ Distinguish whether it is the predetermined less than degree 10b of self-vessel speed, for example, 5 knots, in step SP1. It shifts to step SP11 at the time of below the predetermined degree 10b of self-vessel speed, and when that is not right, it shifts to the following step SP2.

[0151] ◇ In step SP2, perform the same control processing as the case of the 1st above-mentioned example, and shift to step SP3. In addition, since it is over the predetermined degree 10b of self-vessel speed, the direction of movement 10c of a self-ship will be obtained here.

[0152] ◇ In step SP11, take in the data of the direction 15a of a bow given from the heading measurement portion 15, for example, a gyrocompass, or the magnetic compass, for example, 12 degrees of direction of bow 15' of drawing 2 , and shift to step SP3. In addition, in fact, although the value of the direction of movement 10c of a self-ship and the direction 15a of a bow turns into a different value, it is made into the same value on account of Drawings here.

[0153] ◇ although the same control processing as the case of the 1st above-mentioned example is performed in step SP3 - step SP7 When it has gone via step SP11, it constitutes so that data processing of step SP4 and step SP5 may be replaced with the data of the direction of movement 10c of a self-ship and may be performed using the data of the direction 15a of a bow.

[0154] That is, the composition of this 2nd example generally In the navigation equipment it enabled it to display on the display screen, the picture of the cruise related information containing the self-ship wake behind a sailing ship which replaces with the 1st composition in the 1st above-mentioned example, and includes a self-ship position in the 1st, the direction of movement of the present self-ship or the direction of a bow, and a depth line, such as plurality, [0155]

The 1st composition which establishes a sea bed cross-section display means to

display the picture of the sea bed cross section by the side of the front in an above-mentioned direction of movement or the above-mentioned direction of a bow on the above-mentioned display screen, based on each depth-sounding data corresponding to the every place point for displaying a depth line, such as the above-mentioned plurality, and [0156] Self-ship wake-behind-a-sailing-ship CR1 including the self-ship position 10a and the direction of movement 10c of a present progressive of the present self-ship, for example, the direction, In the navigation equipment 100 it enabled it to display on the display screen 81, Picture 82X, for example, the cruise related information picture, of the cruise related information containing the direction 15a of a bow, and the depth lines Ld1-Ld4, such as being contained in a depth line, for example, map data, such as plurality, or [0157] It is based on each depth-sounding data corresponding to the every place point for displaying the depth line Ld1-Ld4, for example, \*\*\*\*\*, such as the above-mentioned plurality. The 1st above-mentioned composition which established a sea bed cross-section display means to display the picture 82Y of the sea bed cross section by the side of the front in the above-mentioned direction of movement 10c or the above-mentioned above-mentioned direction 15a of a bow, for example, a front sea bed cross-section picture, on the above-mentioned display screen 81 will be constituted.

[0158] Moreover, in the 2nd, the 2nd above-mentioned composition - the 4th composition will be constituted like the 1st above-mentioned example. And since the feature in the case of the 1st above-mentioned example and the same feature are acquired according to these 1st composition - the 4th composition, it means that the above-mentioned [1st technical problem] was solved.

[0159] The [3rd example] Drawing 2, drawing 4, and drawing 5 explain the 3rd example hereafter. A part which constitutes this 3rd example with the application of the composition which excepted the portion using the direction of a bow in the 1st above-mentioned composition - the 6th composition in the composition of the 7th conventional technology explained by drawing 18 - drawing 21 - the 11th conventional technology, and is different from the composition of the 1st above-mentioned example is the next part. In addition, past wake-behind-a-sailing-ship CR2 in drawing 2 shall be displayed.

[0160] A depth line, such as plurality contained in the map data memorized by the 1st at the memory 75 for map data, or the file memory portion 90, [ for example, each depth-sounding data corresponding to the every place point for displaying the depth lines Ld1-Ld4, such as drawing 2, ] In addition, it is the part which displayed the sea bed cross-section picture 82Y by the side of the front in the direction 10c of a present progressive, for example, the front sea bed cross-section picture of drawing 2, on the display screen 81 based on the water depth measurement portion 30, for example, each depth-sounding data which used the water depth data of 30a obtained by the shoal-of-fish detection device.

[0161] [ the 2nd ] as the above-mentioned water depth data of 30a when memorizing past wake-behind-a-sailing-ship CR2 in the memory 74 for wake-behind-a-sailing-ship data It is the part constituted so that it might use, the water depth data which the data of the position value used as wake-behind-a-sailing-ship data and the water depth data of 30a were made to correspond, and was memorized in the water depth memory 77 for data, and the water depth data of 30a in the self-ship position 10a, i.e., the data of the present depth of water. In addition, when the water depth data which measured water depth 30a to the predetermined point is only memorized, it constitutes so that the water depth data may also be included.

[0162] And by specifically memorizing beforehand the program of the control processing flow which removed the portions of step SP1 and step SP11 from the control processing flow of drawing 5 in the memory 72 for processing in the composition of drawing 4, it constitutes so that the display by each above-mentioned composition can be performed.

[0163] In addition, this control processing flow is constituted as the same

subroutine as the case of the 1st above-mentioned example, and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0164] [Explanation of a control processing flow] The control processing flow which removed the portions of step SP1 and step SP11 from the control processing flow of drawing 5 is explained hereafter. Therefore, a control processing flow here will be started from step SP2.

[0165] ◇ In step SP2 - step SP4, perform the same control processing as step SP2 of drawing 3 in the 1st example - step SP4, and shift to the following step SP5.

[0166] [ in addition, the front sea bed cross-section erasing signal distinguished by step SP3 ] For example, it constitutes so that a front sea bed cross-section erasing signal may be given to a part for a part for the setting control unit 60 of drawing 19 , and the setting control unit of drawing 21 (60+32) based on operation of the "front sea bed" key 69X prepared like the case of the 1st example, for example.

[0167] ◇ The water depth data which accompanied storage of above past wake-behind-a-sailing-ship CR2, and the position data of the position used as wake-behind-a-sailing-ship data and the water depth data of 30a were made to correspond in step SP5, and was memorized in the water depth memory 77 for data, The water depth data of 30a in the self-ship position 10a, i.e., the data of the present depth of water, and the water depth data which measured [ as opposed to / further only / the predetermined point ] water depth 30a distinguish whether it memorizes to the direction of movement 10c of a self-ship. When water depth data is memorized to the direction of movement 10c of a self-ship, it shifts to the following step SP6, and when that is not right, it shifts to step SP7.

[0168] ◇ The data and depth-sounding data of the position value of the point where each above-mentioned depth-sounding data and the data of the position of the point corresponding to it, for example, past wake-behind-a-sailing-ship CR2 and the direction 10c of a present progressive, cross in step SP6, The water depth data of the self-ship position 10a is taken into the memory 73 for work, and it shifts to the following step SP7.

[0169] ◇ [ step SP7 / based on the position data of the self-ship position 10a and positions P21-P26, calculate each distance from the self-ship position 10a to positions P21-P26, and also ] like step SP5 When there is a position P27 of past wake-behind-a-sailing-ship CR2 taken in by step SP6 About that position P27, by calculating distance, similarly The data of the depth value of the data of each of this distance, each \*\*\*\*\* Ld1-Ld5, and the position P27 of past wake-behind-a-sailing-ship CR2, namely, -- replacing with the front sea bed cross-section picture 82Y of drawing 2 based on water depth data -- the [important section display composition] of drawing 5 -- creation processing of the image data for displaying the front sea bed cross-section picture [ like ] 82Y is carried out.

[0170] Furthermore, while taking the image data into the memory 73 for work and memorizing it, after giving the display-processing portion 80 and displaying the front sea bed cross-section picture 82Y of drawing 5 on a part for the sea bed cross-section display 81A of drawing 2 , it shifts to the following step SP8.

[0171] [ here / the front sea bed cross-section picture 82Y of drawing 5 / a different part from the front sea bed cross-section picture 82Y of drawing 2 ] [ the water depth data of the self-ship position 10a is expressed as the water depth data based on water depth 30a obtained by the water depth measurement portion 30, and ] between the water depth data 40m based on depth [ data / 46m / water depth ] line Ld4 now [ of the self-ship position 10a ] It is the part where the figure of the part based on the water depth data of the position P27 of past wake-behind-a-sailing-ship CR2, for example, 43m data, is displayed. In addition, when the water depth data of \*\*\*\*\* Ld5 differs from water depth

30a measured in the water depth measurement portion 30, you may make it display with the water depth water depth data of 30a.

[0172] Moreover, the memory 78 for front sea bed data is formed, and you may make it memorize the data storage in above step SP4, step SP6, and step SP7 like the case of the 1st example, as the dotted line showed to [drawing 4](#).

[0173] <> Constitute from step SP8 and step SP9 so that control processing by step SP6 and step SP7 in the case of the 1st above-mentioned example by [drawing 3](#) and same control processing may be performed.

[0174] That is, the composition of this 3rd example generally In the 1st, the 1st composition by the 1st above-mentioned example - the 4th composition will be constituted, and further [ the 2nd ] In the 1st composition by the composition of the 1st above-mentioned example - the 3rd composition, as each above-mentioned depth-sounding data Each depth-sounding data based on the depth lines Ld1-Ld5, for example, \*\*\*\*\*, such as the above contained in the map data memorized by the map data 75 memorized beforehand, for example, the memory for map data, and the file memory portion 90, Each depth-sounding data obtained by the water depth measurement portion 30, for example, the water depth data of the self-ship position 10a, i.e., data of the present depth of water, The 5th above-mentioned composition which used the water depth data memorized along with storage of past wake-behind-a-sailing-ship CR2 by the water depth memory 77 for data will be constituted.

[0175] Moreover, in the 3rd, in the 5th above-mentioned composition, while constituting the above-mentioned position measurement portion 10 from satellite electric navigation equipment or amendment satellite electric navigation equipment, the 6th above-mentioned composition which constituted the above-mentioned water depth measurement portion 10 from a shoal-of-fish detection device will be constituted.

[0176] And since the feature in the case of the 1st above-mentioned example and the same feature are acquired according to these 1st composition - the 6th composition, it means that the above-mentioned [1st technical problem] was solved.

[0177] The [4th example] [Drawing 2](#), [drawing 4](#), and [drawing 5](#) explain the 4th example hereafter. A different part from the composition of the 3rd example of the above [ the composition of this 4th example ] is the next part.

[0178] In the 1st, like the case of the 2nd above-mentioned example, the heading measurement portion 15 For example, form the gyrocompass or the magnetic compass and [ predetermined degree 10b of self-vessel speed, at for example, the time of 5 knots or less, ] When displaying the front sea bed cross-section picture 82Y using the direction 15a of a bow acquired by the heading measurement portion 15 and exceeding the predetermined degree 10b of self-vessel speed, for example, 5 knots It is the part constituted so that the front sea bed cross-section picture 82Y might be displayed using the direction of movement 10c of a self-ship obtained by the position measurement portion 10, for example, satellite electric navigation equipment, or amendment satellite electric navigation equipment.

[0179] In order to make the above-mentioned display perform in the 2nd, it is the part constituted so that the program of the whole control processing flow of [drawing 5](#) might be beforehand memorized in the memory 72 for processing in the composition of [drawing 4](#).

[0180] In addition, this control processing flow is constituted as the same subroutine as the case of the 1st above-mentioned example, and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0181] [Explanation of a control processing flow] The control processing flow of [drawing 5](#) is explained hereafter.

<> In step SP1, step SP2, and step SP11, perform the same control processing as the case of the 2nd example by above-mentioned [drawing 3](#), and shift to the

following step SP3.

◁ Constitute from step SP3 - step SP9 so that the same control processing as the case of the 3rd above-mentioned example may be performed.

[0182] That is, the composition of this 4th example generally In the 1st, the 1st composition by the 2nd above-mentioned example - the 4th composition will be constituted, and further [ the 2nd ] In the 1st composition by the composition of the 2nd above-mentioned example - the 3rd composition, the 5th above-mentioned composition and 6th composition by the 3rd above-mentioned example will be constituted.

[0183] And since the feature in the case of the 1st above-mentioned example and the same feature are acquired according to these 1st composition - the 6th composition, it means that the above-mentioned [1st technical problem] was solved.

[0184] The [5th example] Drawing 6 - drawing 9 explain the 5th example hereafter. A part which constitutes the composition of this 5th example with the application of the 7th above-mentioned composition - the 11th composition in the composition of the 7th conventional technology explained by above-mentioned drawing 18 - drawing 21 - the 11th conventional technology, and is different from the composition of the above-mentioned 7th conventional technology - the 11th conventional technology is the next part.

[0185] new to the 1st -- etc. -- a depth line, such as being contained in the depth line, i.e., the map data memorized by the memory 75 for map data, -- namely, -- while setting up the water depth predetermined value for creating depth line Ld, such as creation [ of a depth line, for example, drawing 7, such as different different depth of water from depth line Ld, such as ready-made / of a depth line, for example, drawing 7, //, such as ready-made/, 1, and Ld5, ], 11, for example, the water depth water depth value of 20m

[0186] It is the part constituted so that the data of these water depth values might be memorized into a storage portion at Storage 77Y, for example, the memory for setting depth-sounding data of drawing 6. in addition, when the depth [ map data ] line is not included, it comes to resemble that the above-mentioned water depth value sets up the proper water depth value for which it wishes

[0187] The water depth predetermined value set as the 2nd, for example, the position where 20 water depthm was obtained, For example, the data of the ship position 10a is memorized into a storage portion as data of a predetermined depth-sounding position value each one obtained by the position measurement portion 10 in each position value of predetermined depth-sounding position LP1 of drawing 7, i.e., the position. For example, it is the part constituted so that it might be made the shape of a table like drawing 8 for example, and might memorize in the memory 77Y for setting depth-sounding data of drawing 6.

[0188] The data of the predetermined depth-sounding position value memorized by the 3rd at the memory 77Y for setting depth-sounding data, For example, sequence predetermined in latitude and a longitude value (A1) - (A6) each position value of predetermined depth-sounding position LP1, For example, it is the part constituted so that it might be made the shape of a table like drawing 8 for example, and might memorize into the storage portion which arranges and changes so that it may be made the sequence that a longitude value is small, for example, is equivalent to the "position data" column of the memory 79 for depth line data, such as drawing 6.

[0189] In the memory 79 for \*\*\*\*\* data the 4th The point of the data of a predetermined depth-sounding position value, Namely, the segment prepared data for creating the segment which connects between the every place points of predetermined depth-sounding position LP1, for example, each association line part LL1 of drawing 7, For example, it is the part constituted so that it might be made the shape of a table like drawing 8 for example, and might memorize into the storage portion equivalent to the "segment" column of the memory 79 for



depth [ data / of "\*" ] line data.

[0190] The memory content of the storage portion which is equivalent to the 3rd at the "position data" column of the memory 79 for \*\*\*\*\* data, it is the part constituted so that depth line Ld, such as creation/,11 might be displayed on the display screen 81 by giving and carrying out display processing of each data obtained by the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data carrying out memory content reading appearance to the display-processing portion 80.

[0191] When displaying depth line Ld, such as above-mentioned creation/,11 on the 4th and depth line Ld, such as each ready-made/,1 and Ld5 are contained in the map data beforehand memorized into the memory 75 for map data, or the file memory portion 90 It is the part constituted so that depth line Ld, such as these,11, Ld1, and Ld5 might be merged and displayed on the display screen 81 by giving and carrying out display processing of depth line Ld, such as depth line Ld11 and each ready-made/, such as creation/,1 and Ld5 to the display-processing portion 80.

[0192] The figure which displays the point of each predetermined depth-sounding positions LP1-LP3 currently displayed on the display screen 81 on the 5th, for example, the figure of O form, Or a segment LL1-LL3, parts for for example, an association line, is specified using the designated point CP by cursor CLX-CLY, for example. It is the part constituted so that the data storage of "\*" memorized by the "segment" column of the above-mentioned segment prepared data 79, for example, the memory for \*\*\*\*\* data, might be eliminated or the data storage of "\*" could be added.

[0193] [ the 6th / a water depth predetermined value ] while setting two or more water depth predetermined values, for example, the water depth water depth value of 20 m.30 m.40m, as the 6th The storage portion equivalent to the "position data" column of the memory 79 for depth line data, such as the above, [ the storage portion equivalent to the "segment" column of the memory 79 for depth line data, such as the above, ] It is the part constituted so that the storage portion corresponding to two or more water depth predetermined values, for example, the water depth water depth value of 20 m.30 m.40m, might be prepared and depth line Ld, such as two or more creation/, 11, Ld12, Ld13, etc. could be displayed on the display screen 81.

[0194] That is, the composition of this 5th example generally The position measurement data of the self-ship position 10a obtained by the position measurement portion 10 by the 1st, [0195] being based on the water depth measurement data 30a of the water depth value corresponding to the above self-ship position 10a obtained by the water depth measurement portion 30 -- etc. -- [ the picture of the cruise related information containing depth line Ld11 ] in the navigation equipment 100 it enabled it to display on the display screen 81 While setting up the water depth predetermined value for creating depth line Ld, such as the above,11, for example, 20 water depthm Prepare the 1st storage portion which memorizes the above-mentioned water depth predetermined value, for example, the predetermined depth-sounding position value corresponding to 20 water depthm, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, and [0196] The position value 10a of the above-mentioned position measurement data at the time of the above-mentioned water depth measurement data 30a becoming the above-mentioned water depth predetermined value, for example, 20m, the above-mentioned predetermined depth-sounding position value, For example, a predetermined depth-sounding position value storage means to memorize as latitude longitude value (A1) - (A6) into the 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, and [0197] The above-mentioned predetermined depth-sounding position value memorized into the 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, For example, the segment which connects

between a latitude longitude value (A1) - (A6) points For example, a segment storage means to memorize the segment prepared data for creating association line part LL1, for example, the data of "\*\*\*", into the 2nd storage portion, for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data, and [0198] The 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, Based on each data read and obtained, each memory content of the 2nd above-mentioned storage portion, for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data, depth lines, such as the above, For example, the 7th above-mentioned composition which established the depth line display means, such as displaying \*\*\*\*\* Ld11 on the above-mentioned display screen 81, is constituted.

[0199] To the 2nd, in the 7th above-mentioned composition, moreover, the above-mentioned water depth predetermined value, For example, a depth line, such as being contained in the map data memorized by the map data 75 which memorized the water depth value of 20m beforehand, for example, the memory for map data, and the file memory portion, Namely, while setting to water depth values of depth line Ld1 and Ld5, such as depth lines, i.e., ready-made/etc., such as a map, for example, a water depth value which is different in water depth value 10 m.50m, and creating depth lines, for example, creation / depth line Ld11, such as the above The 8th above-mentioned composition which added depth lines, for example, a merge display means to merge and display a ready-made / depth line Ld1, and Ld5, such as depth lines, for example, creation / depth line Ld11, the above-mentioned map, etc., such as the above, is constituted.

[0200] Furthermore, while making the above-mentioned water depth predetermined value into two or more water depth predetermined values, for example, water depth 20 m.30 m.40m, and setting it as the 3rd in the 7th above-mentioned composition and 8th composition The 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, By preparing two or more above-mentioned water depth predetermined values, for example, the storage portion corresponding to water depth 20 m.30 m.40m, in the 2nd above-mentioned storage portion, for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data The 9th above-mentioned composition which displayed the depth lines Ld11-Ld13, such as depth lines, for example, creation/etc., such as two or more above, on the above-mentioned display screen 81 is constituted.

[0201] Moreover, the figure which displays the above-mentioned point LP1-LP3, for example, each predetermined depth-sounding positions, on the 4th in the 7th above-mentioned composition - the 9th composition, for example, the figure of O form, Or specify the above-mentioned segment LL1-LL3, parts for for example, an association line, and the above-mentioned segment prepared data, for example, the data storage of "\*\*\*", is eliminated. Or the 10th above-mentioned composition which added a segment elimination addition means to add the above-mentioned segment prepared data, for example, the data storage of "\*\*\*", is constituted.

[0202] Furthermore, in the 5th, in the 7th above-mentioned composition - the 10th composition, while constituting the above-mentioned position measurement portion 10 from satellite electric navigation equipment or amendment electric navigation equipment, the 11th above-mentioned composition which constituted the above-mentioned water depth measurement portion 30 from a shoal-of-fish detection device is constituted.

[0203] And by memorizing the program of the control processing flow of drawing 9 beforehand in the memory 72 for processing of drawing 6, specifically, it constitutes so that the display by each above-mentioned composition can be performed.

[0204] In addition, this control processing flow is constituted as Zabul Ching, the main control manipulation routine for performing control processing of the whole in the cruise Data Processing Division portion 70 of drawing 6 , and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0205] [Explanation of a control processing flow] The control processing flow of drawing 9 is explained hereafter. In addition, control processing for creating and displaying depth line Ld, such as creation/,11, Ld12, and Ld13 shall be performed here by setting a water depth predetermined value to 20 m.30 m.40m.

[0206] <> Distinguish whether a depth setup of depth lines, such as creation/, i. e., a water depth predetermined value, is ending with a setting in step SP1. When it is ending with a setting, it shifts to step SP3, and when that is not right, it shifts to the following step SP2.

[0207] Here, since a setup of a water depth value may set up other water depth value 30 m.40m after setting up the water depth value of 20m first, it distinguishes whether there is any setting input at every setup of the, for example.

[0208] Moreover, the "grade depth line" key 69Y shown in a part for the control unit for creating a depth line, such as having prepared the setting input in a part for the setting control unit 60, a part for for example, the setting control unit of drawing 21 , (60+32) by the dotted line is operated. The menu screen for setting up the conditions of depth lines, such as creation/, is displayed, and a value setpoint signal input is carried out, and a necessary water depth value, for example, the signal which sets up water depth value 20 m.30 m.40m, is constituted so that whether this water depth value setpoint signal is memorized by the memory 73 for work may perform [ water depth ] the above-mentioned distinction.

[0209] <> In step SP2, take in the above-mentioned water depth value setpoint signal, for example, memorize water depth predetermined value 20 m.30 m.40m like drawing 8 , for example in the memory 79 for depth [ memory / 77Y / for setting depth-sounding data ] line data.

[0210] each depth-sounding value 20m.30 [ and ] memorized -- the position data of the self-ship position 10a when the water depth value is acquired every m.40 m -- every place -- a law -- the data of depth-sounding position LP1, LP2, and LP3 -- For example, the storage portion equivalent to the "position data" column for making it the shape of a table as a latitude longitude value (A1) - (A6) - latitude longitude value (B1) - (B7) ...., and memorizing is made.

[0211] Furthermore, it corresponds to the data of each predetermined depth-sounding position LP1, LP2, and LP3 of the "position data" column of the memory 79 for \*\*\*\*\* data. The storage portion equivalent to the "segment" column for making the segment data for creating each association line LL1, LL2, and LL3 equivalent to each segment of depth line Ld, such as creation/,11, Ld12, and Ld13, for example, "\*\*\*", into the shape of a table, and memorizing it is made.

[0212] <> predetermined [ which the present water depth data of 30a set up in step SP3 ] -- each -- distinguish whether it became one water depth value of the depth-sounding value 20 m.30 m.40m. When it becomes one of the water depth values, it shifts to the following step SP4, and when that is not right, it returns to the predetermined step part of a main control manipulation routine.

[0213] A distinction value here distinguishes whether the water depth data of 30a is in agreement with either of the data of a water depth predetermined value as compared with water depth predetermined value 20 m.30 m.40m memorized by the memory 77Y for setting depth-sounding data.

[0214] <> The time of being in agreement with either of the data of a water depth predetermined value in step SP4, For example, when in agreement with the water depth value of 20m, the data of the data of the obtained self-ship position 10a, i.e., a latitude longitude value, for example, a latitude longitude value, (A6) as data of a predetermined depth-sounding position value After

memorizing into the storage portion which is once equivalent to the column of the water depth value to which the memory 77Y for setting depth-sounding data corresponds, for example, the with a water depth value [ in the memory 77Y for setting depth-sounding data of drawing 8 ] of 20m "position data" column, it shifts to the following step SP5.

[0215] In addition, let the data of latitude longitude value (A1) - (A5) be data of the predetermined depth-sounding position value acquired by these step SP4 by last time on account of explanation here.

[0216] <> The water depth value to which the memory 77Y for setting depth-sounding data once corresponds in step SP5, For example, the predetermined depth-sounding position value memorized into the storage portion equivalent to the with a water depth value of 20m "position data" column, For example, [ the data of a latitude longitude value (A6) ] as compared with the data of the position value memorized by the storage portion which is already equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data so that it may become predetermined sequence, for example, the sequence that a longitude value is small For example, after replacing storage sequence and rememorizing like the 20m "position data" column in the memory 79 for depth line data, such as drawing 8 , it shifts to the following step SP6.

[0217] <> memorizing in step SP6 in the "segment" column of the memory 79 for depth [ segment data /, for example, "\*\*\*" etc., ] line data -- etc. -- distinguish whether creation, for example, association line LL1, is created for the segment of a depth line. When creating a segment, it shifts to the following step SP7, and when that is not right, it shifts to step SP8.

[0218] Distinction here shall have memorized segment data, for example, "\*\*\*", when the predetermined depth-sounding position value is only memorized by the storage portion equivalent to the column of the order of the point in the "position data" column of the memory 79 for \*\*\*\*\* data.

[0219] that is, -- for example, -- since the latitude longitude value (A4) is memorized by the column of the order of the point of the data of a latitude longitude value (A6) if the data of the latitude longitude value (A6) was memorized in the "position data" column of the memory 79 for depth line data -- it can set to drawing 8 -- segment data -- \*\*\*\*\* -- \*\*\*\*\* -- it distinguishes.

[0220] <> In step SP7, shift to the following step SP8 after memorizing segment data. Like the example of above step SP6, storage here memorizes the data of "\*\*\*" into the storage portion equivalent to the "segment" column corresponding to the data of a latitude longitude value (A6), when the latitude longitude value (A4) is memorized by the column of the order of the point of the data of a latitude longitude value (A6).

[0221] <> Distinguish whether depth line Ld, such as creation/,11, Ld12, and Ld13 are displayed in step SP8. When displaying, it shifts to the following step SP9, and when that is not right, it returns to the predetermined step part of a main control manipulation routine.

[0222] Distinction here operates the "grade depth line" key 69Y shown in a part for the setting control unit of drawing 21 (60+32) by the dotted line, for example. The menu screen for setting up the conditions of depth lines, such as creation/, is displayed, and it constitutes so that it may distinguish by whether depth line display signals, such as the signal which chose "the display", i.e., creation/etc., are memorized by the memory 73 for work.

[0223] <> Data required for the display of depth lines, such as creation/, at step SP9 for example, when [ which carry out data reading appearance and gives the display-processing portion 80 ] the "position data" column of the memory 79 for depth line data -- it can set to drawing 8 -- and the "segment" column memorize After displaying the portion memorized by the memory 79 for depth line data among depth line Ld, such as creation/,11, Ld12, and Ld13 etc. on the display screen 81, it shifts to the following step SP10.

[0224] <> Distinguish whether the necessary segment of depth line Ld, such as creation/,11, Ld12, and Ld13, for example, either of association line part LL1, is

changed in step SP10. When changing, it shifts to the following step SP11, and when that is not right, it shifts to step SP12.

[0225] Distinction here operates the "grade depth line" key 69Y shown in a part for the setting control unit of drawing 21 (60+32) by the dotted line, for example. The menu screen for setting up the conditions of depth lines, such as creation/, is displayed, and it constitutes so that it may distinguish by whether depth line change signals, such as the signal which chose "change", i.e., creation/ etc., are memorized by the memory 73 for work.

[0226] < The segment of depth line Ld, such as creation/currently displayed on the display screen 81 in step SP11, Ld12, and Ld13, Namely, the arbitrary things of association line part LL1, LL2, and LL3 are eliminated. Or the new segment which connects the arbitrary points of the predetermined depth-sounding positions LP1-LP3, a part for i.e., a new association line, is added, and manual change operation of changing the alignment of the arbitrary things of depth line Ld, such as creation/, Ld12, and Ld13 is performed.

[0227] [ "elimination operation" by manual change operation here / the designated point CP by cursor CLX-CLY of drawing 7 ] by operating a part for "cursor" key 62H and the arbitrary directional movement control unit 68 of drawing 21 It is made in agreement with the figure which displays the point of the predetermined depth-sounding positions LP1-LP3 of the part which wants to eliminate a segment, for example, the figure of O form, and the position for an association line LL1-LL3, and specifies.

[0228] In the state, by operating "elimination" key 64F of drawing 21, the data storage of "\*\*\*" memorized by the "segment" column of the memory 79 for segment prepared data, for example, \*\*\*\*\* data, is eliminated, and the segment is eliminated.

[0229] Moreover, "add operation" is in the state which specified the figure which displays the point of the predetermined depth-sounding positions LP1-LP3 of a part to add a segment to by same operation, for example, the figure of O form. By operating the "setting" key 62F of drawing 21, the data storage of above "\*\*\*" is added and a new segment is added.

[0230] That is, by eliminating association line part LL1A of depth line Ld11, such as creation/, and specifically adding association line part LL1B shown by a dotted line as a new segment like the [segment change composition] of drawing 7 In order to coincide alignment of depth line Ld11, such as creation/, with actual alignment, it enables it to perform the above-mentioned "elimination operation" and "add operation."

[0231] < Distinguish whether depth line Ld, such as creation/, Ld12, and Ld13 are eliminated in step SP12. When eliminating, it shifts to the following step SP13, and when that is not right, it returns to the predetermined step part of a main control manipulation routine.

[0232] Distinction here operates the "grade depth line" key 69Y of drawing 21, for example. The menu screen for setting up the conditions of depth lines, such as creation/, is displayed, and it constitutes so that it may distinguish by whether depth line erasing signals, such as the signal which chose "elimination", i.e., creation/etc., are memorized by the memory 73 for work.

< In step SP13, return to the predetermined step part of a main control manipulation routine after eliminating depth line Ld, such as creation/, Ld12, and Ld13.

[0233] [ in that is, the menu screen on which the "grade depth line" key 69Y was operated and displayed according to the composition of this 5th example ] Water depth value 20 m.30 m.40m, such as depth line Ld, such as wanting to newly create, Ld12, and Ld13, etc. is set up. The accumulation storage of the position data of predetermined depth position LP1, LP2, and LP3 and the segment prepared data of association line part LL1, LL2, and LL3 is carried out at the memory 79 for depth [ inside / where the self-ship is cruising through various routes ] line data. The feature that \*\*\*\*\*Ld11, Ld12, Ld13, etc. can be displayed now is acquired. therefore, new -- etc. -- since \*\*\*\*\* becomes

unnecessary specially for making a depth line in whether it is size, it means that the above-mentioned [2nd technical problem] was solved

[0234] The [6th example] Drawing 6 and drawing 10 - drawing 12 explain the 6th example hereafter. A different part from the composition of the 5th example of the above [ the composition of this 6th example ] is the next part.

[0235] the 1st -- drawing 11 -- like -- etc. -- to the position value (A8), for example, the latitude longitude value, of the point newly memorized by the "position data" column with a predetermined depth of 20m of the memory 79 for depth line data The position value of a point with a predetermined depth of 20m adjoining, i.e., the distance value between the position values memorized by the column of the order of the point, and the following order, for example, the distance value between a latitude longitude value (A8) and the latitude longitude value by the side of the order of the point (A1), [ a distance value ] although the distance value between a latitude longitude value (A8) and the latitude longitude value by the side of the following order (A6) will call it the distance value between the points of a position value with a predetermined depth of 20m Only when distinguishing these distance values separately and below the predetermined distance value  $d_s$  (not shown) has become 0.5km or less, it is the part changed so that the conditions of memorizing "\*\*\*" might be established.

[0236] That is, [ since the distance value between a latitude longitude value (A8) and the latitude longitude value by the side of the order of the point (A1) is over the predetermined distance value  $d_s$  in the case of drawing 11, the storage portion equivalent to the "segment" column corresponding to a latitude longitude value (A8) is made into "a null, i.e., a storage state without a segment," but ] Since the distance value between a latitude longitude value (A8) and the latitude longitude value by the side of the following order (A6) is below the predetermined distance value  $d_s$ , the storage portion equivalent to the "segment" column corresponding to a latitude longitude value (A6) is made into "\*\*", i.e., a storage state with a segment." In addition, it cannot be overemphasized that it is similarly processed to the storage portion equivalent to other columns of predetermined depth-sounding 30 m.40m.

[0237] The portion which only the portion for an association line LLX which depth line  $L_d$ , such as creation/,11,  $L_d12$ , and  $L_d13$  showed as the solid line was displayed on the 2nd by storage of "\*\*\*" by the above-mentioned conditions like drawing 10, and was shown by the dotted line is the part changed and constituted so that it might not be displayed.

[0238] It constitutes so that the point connected by the segment like drawing 10 if needed, for example, the figure which displays the part of the predetermined depth-sounding position LPX connected by a part for an association line LLX, may be displayed on the 3rd with a small figure, for example, the figure of small black -.

[0239] Furthermore, it constitutes so that the point which is not connected by a segment, for example, the figure which displays the part of the predetermined depth-sounding position LPX which is not connected by a part for an association line LLX, may be displayed with a large figure, for example, the figure of large O. It is the part constituted so that it could gaze at the point of a water depth predetermined value existing in the point which is not connected by the above-mentioned segment.

[0240] It constitutes so that the point connected by the segment if needed, for example, the figure which displays the part of the predetermined depth-sounding position LPX connected by a part for an association line LLX, for example, the figure of small black -, may be displayed on the 4th by regular brightness.

[0241] Furthermore, the point which is not connected by a segment, for example, the figure which displays the part of the predetermined depth-sounding position LPX which is not connected by a part for an association line LLX, For example, it is the part which constituted so that the figure of large O might be displayed, or might be blinked by brightness brighter than regular brightness, for

example, the brightness of regular double, and it might display, and was constituted so that it could gaze at the point of a water depth predetermined value existing in the point which is not connected by the above-mentioned segment.

[0242] That is, the composition of this 6th example generally The position measurement data of the self-ship position 10a obtained by the position measurement portion 10 by the 1st, [0243] being based on the water depth measurement data 30a of the water depth value corresponding to the above self-ship position 10a obtained by the water depth measurement portion 30 -- etc. -- [ the picture of the cruise related information containing depth line Ld11 ] in the navigation equipment 100 it enabled it to display on the display screen 81 While setting up the water depth predetermined value for creating depth line Ld, such as the above, 11, for example, 20 water depthm Prepare the 1st storage portion which memorizes the above-mentioned water depth predetermined value, for example, the predetermined depth-sounding position value corresponding to 20 water depthm, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, and [0244] The position value 10a of the above-mentioned position measurement data at the time of the above-mentioned water depth measurement data 30a becoming the above-mentioned water depth predetermined value, for example, 20m, the above-mentioned predetermined depth-sounding position value, For example, a predetermined depth-sounding position value storage means to memorize as latitude longitude value (A1) - (A6) into the 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, and [0245] The above-mentioned predetermined depth-sounding position value memorized into the 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, For example, a latitude longitude value (A1) - (A6) below a distance value predetermined in between points [0246] for example, [ means / to memorize the segment prepared data for creating the segment LLX which connects between \*\* of 0.5km or less, a part for for example, an association line, for example, the data of "\*\*\*", into the 2nd storage portion for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data, / segment storage ] The 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, Based on each data read and obtained, each memory content of the 2nd above-mentioned storage portion, for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data, depth lines, such as the above, For example, the 12th above-mentioned composition which established the depth line display means, such as displaying \*\*\*\*\* Ld11 on the above-mentioned display screen 81, is constituted.

[0247] Moreover, while displaying the point connected by the above-mentioned segment, for example, the figure which displays the part of the predetermined depth-sounding position LPX connected by a part for an association line LLX, on the 2nd with a small figure, for example, the figure of small black -, in the 12th above-mentioned composition The 13th above-mentioned composition which displayed the point which is not connected by the above-mentioned segment, for example, the figure which displays the part of the predetermined depth-sounding position LPX which is not connected by a part for an association line LLX, with the large figure, for example, the figure of large O, is constituted.

[0248] Moreover, the point connected with the 3rd by the above-mentioned segment in the 12th above-mentioned composition and 13th composition, For example, while expressing the figure which displays the part of the predetermined depth-sounding position LPX connected by a part for an association line LLX, for example, the figure of small black -, as regular brightness The point which is not connected by the above-mentioned segment,

for example, the figure which displays the part of the predetermined depth-sounding position LPX which is not connected by a part for an association line LLX, For example, the 14th above-mentioned composition which the figure of large O is displayed, or is blinked by brightness brighter than regular brightness, for example, the brightness of regular double, and was displayed is constituted.

[0249] To the 4th, in the 12th above-mentioned composition - the 14th composition, furthermore, the above-mentioned water depth predetermined value, For example, a depth line, such as being contained in the map data memorized by the map data 75 which memorized the water depth value of 20m beforehand, for example, the memory for map data, and the file memory portion, Namely, while setting to water depth values of depth line Ld1 and Ld5, such as depth lines, i.e., ready-made/etc., such as a map, for example. a water depth value which is different in water depth value 10 m.50m, and creating depth lines, for example, creation / depth line Ld11, such as the above The 15th above-mentioned composition which added depth lines, for example, a merge display means to merge and display a ready-made / depth line Ld1, and Ld5, such as depth lines, for example, creation / depth line Ld11, the above-mentioned map, etc., such as the above, is constituted.

[0250] Moreover, while making the above-mentioned water depth predetermined value into two or more water depth predetermined values, for example, water depth 20 m.30 m.40m, and setting it as the 5th in the 12th above-mentioned composition - the 15th composition The 1st above-mentioned storage portion, for example, the storage portion equivalent to the "position data" column of the memory 79 for \*\*\*\*\* data, By preparing two or more above-mentioned water depth predetermined values, for example, the storage portion corresponding to water depth 20 m.30 m.40m, in the 2nd above-mentioned storage portion, for example, the storage portion equivalent to the "segment" column of the memory 79 for \*\*\*\*\* data The 16th above-mentioned composition which displayed the depth lines Ld11-Ld13, such as depth lines, for example, creation/etc., such as two or more above, on the above-mentioned display screen 81 is constituted.

[0251] Furthermore, the figure which displays the above-mentioned point LP1-LP3, for example, each predetermined depth-sounding positions, on the 6th in the 12th above-mentioned composition - the 16th composition, for example, the figure of O form, Or specify the above-mentioned segment LL1-LL3, parts for for example, an association line, and the above-mentioned segment prepared data, for example, the data storage of "\*\*\*", is eliminated. Or the 17th above-mentioned composition which added a segment elimination addition means to add the above-mentioned segment prepared data, for example, the data storage of "\*\*\*", is constituted.

[0252] Moreover, in the 7th, in the 12th above-mentioned composition - the 17th composition, while constituting the above-mentioned position measurement portion 10 from satellite electric navigation equipment or amendment electric navigation equipment, the 18th above-mentioned composition which constituted the above-mentioned water depth measurement portion 30 from a shoal-of-fish detection device is constituted.

[0253] And by memorizing the program of the control processing flow of drawing 12 beforehand in the memory 72 for processing of drawing 6, specifically, it constitutes so that the display by each above-mentioned composition can be performed.

[0254] In addition, this control processing flow is constituted as the same Zabul Ching as the control processing flow of drawing 9, and for every second, it consists of main control manipulation routines, for example so that it may shift to this control processing flow.

[0255] [Explanation of a control processing flow] The control processing flow of drawing 12 is explained hereafter. In addition, control processing for creating and displaying depth line Ld, such as creation/,11, Ld12, and Ld13 shall be performed here by setting a water depth predetermined value to 20 m.30 m.40m.



[0256] ◇ In step SP1 - step SP5, perform the same control processing as step SP1 in the control processing flow of drawing 9 - step SP5, and shift to the following step SP6.

[0257] ◇ step SP6 -- new -- etc. -- [ point / of the position value of the predetermined depth of water taken into the "position data" column of the memory 79 for depth line data ] The distance value between the points of the position value of the same predetermined depth of water which adjoins the point distinguishes whether below the predetermined distance value ds (not shown) is 0.5km or less. When having become below the predetermined distance value ds, it shifts to the following step SP7, and when that is not right, it shifts to step SP8.

[0258] Distinction here memorizes the data of the predetermined distance value ds in the "predetermined distance value" column of the memory 79 for \*\*\*\*\* data beforehand first. For example, the position value of the point which was newly taken in in the case of the "position data" column with a predetermined depth of 20m. For example, distance value dm1 to a position value (A1) with a predetermined depth of 20m which adjoins a latitude longitude value (A8), for example, a latitude longitude value, (not shown), Data processing of distance value dm2 to a latitude longitude value (A6) (not shown), i.e., each distance value dm1 and dm2 between the points of the position value of the adjoining same predetermined depth of water, is carried out, and they are calculated.

[0259] Next, either these distance value dm1 and dm2 distinguish by whether it has become below the predetermined distance value ds. [ each ] In addition, only distance value dm2 between the point of a latitude longitude value (A8) and the point of a latitude longitude value (A6) assume that it has become below the predetermined distance value ds here.

[0260] ◇ In step SP7, shift to the following step SP8 after memorizing the segment prepared data for creating a segment between the points which have become below the predetermined distance value ds into a predetermined storage portion.

[0261] [ storage processing here ] as segment prepared data for, for example, displaying the segment LLX which connects between the point of a latitude longitude value (A8), and the points of a latitude longitude value (A6), a part for i.e., an association line Control processing which memorizes the data of "\*\*\*" into the storage portion equivalent to the "segment" column corresponding to the latitude longitude value (A6) of the "position data" column of the memory 79 for \*\*\*\*\* data is performed.

[0262] ◇ In step SP8 - step SP13, perform the same control processing as step SP8 in the control processing flow of drawing 9 - step SP13, and shift to the predetermined step part of a main control manipulation routine.

[0263] [ in addition, "segment change" by step SP11 in this 6th example ] The part exceeding the predetermined distance values ds in depth line Ld12, such as with a predetermined depth of 30m creation/, i.e., the part of an excess of predetermined distance shown by the dotted line, is specifically judged from the actual condition, for example like the [segment change composition] of drawing 10. As the solid line showed, it constitutes so that a part for the new association line LLY may be displayed and change processing may be carried out.

[0264] [ in that is, the menu screen on which the "grade depth line" key 69Y was operated and displayed like the case of the 5th above-mentioned example according to the composition of this 6th example ] Water depth value 20 m.30 m.40m, such as depth line Ld, such as wanting to newly create, 11, Ld12, and Ld13, etc. is set up. the accumulation storage of the position data of the predetermined depth position LPX and the segment prepared data for an association line LLX is carried out at the memory 79 for depth [ inside / where the self-ship is cruising through various routes ] line data -- etc. -- the feature that depth line Ld11, Ld12, Ld13, etc. can be displayed now is acquired. therefore, new -- etc. -- since \*\*\*\*\* becomes unnecessary specially for making

a depth line in whether it is size, it means that the above-mentioned [2nd technical problem] was solved

[0265] [Deformation implementation] It includes this invention deforming as follows and carrying it out.

(1) Change and constitute the storage by memory parts other than memory 72 for processing in the composition of drawing 1, drawing 4, and drawing 6 so that it may memorize to the storage region which these memory parts were made to correspond and was classified into one memory.

[0266] (2) Prepare and constitute the heading measurement portion 15 in the composition of the 5th example and the 6th example by the composition of drawing 6.

(3) Remove and constitute the heading measurement portion 15 in the composition of the 5th example and the 6th example by the composition of drawing 6.

[0267] (4) Arrange and constitute a part for the setting control unit 60 in the 3rd operation - the composition of the 6th example in the lower part side of the display screen 81.

(5) Add and constitute a part for a control unit required for operation and the "grade depth line" key 69Y as a shoal-of-fish detection device [ in / for a part for the setting control unit 60 / a part for the setting control unit of drawing 21 (60 +32) ] in a part for a setting control unit 60 like drawing 17 in the composition of the above (4).

[0268] (6) Replace with the water depth data of 30a in the composition of drawing 4 and drawing 6, and constitute so that the depth of water in which the transducer 35 of the water depth measurement portion 30 is formed, i.e., the data which added the value of the depth from the water surface to the transducer 35 to the water depth data of 30a, may be used as data of a water depth value.

[0269]

[Effect of the Invention] it will obtain, if distance until it arrives at a front water depth situation and the ocean space of the depth of water made into the purpose rather than a self-ship position, even if it is not a case in the cruise state where a past wake behind a sailing ship is followed, when predetermined operation is performed above like according to this invention etc. can be known, and the feature is acquired.

[0270] Moreover, by setting up the water depth value of a depth line, such as wanting to newly create, by predetermined operation a depth line -- while the self-ship is cruising through various routes, accumulation storage is carried out and the data for creating the \*\*\*\*\* considers it as the purpose -- can be displayed now -- etc. -- there are effects -- the feature that \*\*\*\*\* becomes unnecessary in whether it is the size for creating a depth line is acquired.

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#### [Brief Description of the Drawings]

Drawing 1 - drawing 12 show this example of working of an invention among Drawings, and drawing 13 - drawing 21 show the conventional technology, and the contents of each figure are as follows.

[Drawing 1] Whole block diagram

[Drawing 2] Important section display block diagram

[Drawing 3] Important section control processing block diagram

[Drawing 4] Whole block diagram

[Drawing 5] Important section control processing block diagram

[Drawing 6] Whole block diagram

[Drawing 7] Important section display block diagram

[Drawing 8] Important section storage block diagram

[Drawing 9] Important section control processing block diagram

[Drawing 10] Important section display block diagram

[Drawing 11] Important section storage block diagram

[Drawing 12] Important section control processing block diagram

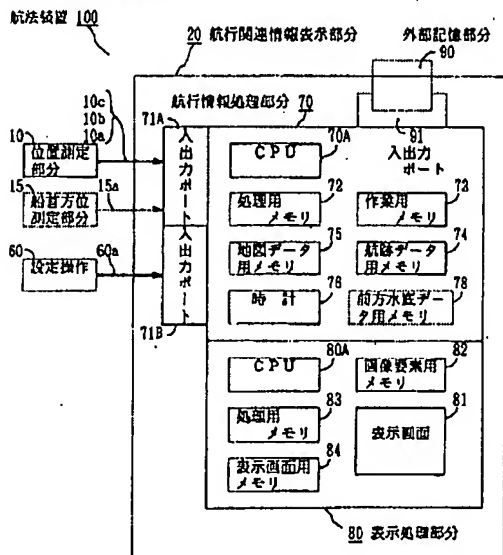
[Drawing 13] Whole block block diagram  
 [Drawing 14] Whole concrete composition perspective view  
 [Drawing 15] Important section concrete composition front view  
 [Drawing 16] Important section display block diagram  
 [Drawing 17] Important section concrete composition front view  
 [Drawing 18] Whole block block diagram  
 [Drawing 19] Whole concrete composition perspective view  
 [Drawing 20] Whole concrete composition perspective view  
 [Drawing 21] Important section concrete composition front view  
 [Explanations of letters or numerals]  
 10 Position Measurement Portion  
 20 A Part for Cruise Related Information Display  
 10a Self-ship position  
 10b The degree of self-vessel speed  
 10c The direction of a present progressive  
 15 Heading Measurement Portion  
 15a The direction of a bow  
 30 Water Depth Measurement Portion  
 30a Depth of water  
 31 Display Screen  
 31d The present depth of water  
 32 A Part for Setting Control Unit  
 35 Transducer  
 60 A Part for Setting Control Unit  
 60a Setpoint signal  
 61 Screen Selection Operation Portion  
 62 A Part for Setting Control Units, Such as Destination  
 62A "Menu" key  
 62B "Destination" key  
 62C "\*\*\*\*\*" key  
 62D "Cancellation" key  
 62F "Determination" key  
 62G "Navigation change" key  
 62H "Cursor" key  
 62J "Return" key  
 62X A part for setting control units, such as a destination  
 63 A Part for Wake-behind-a-Sailing-Ship Setting Control Unit  
 63X A part for a wake-behind-a-sailing-ship setting control unit  
 63A "Wake-behind-a-sailing-ship color" change-over switch  
 63B Wake-behind-a-sailing-ship "storage" key  
 63C Wake-behind-a-sailing-ship "call" key  
 63D Wake-behind-a-sailing-ship "\*\*\*" (ON/OFF) key  
 63E Wake-behind-a-sailing-ship "elimination" key  
 64 A Part for Mark Setting Control Unit  
 64A "Mark color" change-over switch  
 64B-64E "Mark" key  
 64F "Mark elimination" key  
 65 A Part for Setting Control Units, Such as Numeric Value  
 66 A Part for Screen Setting Control Unit  
 66 A Part for Screen Setting Control Unit  
 66A-66C "Scale rate" key  
 66D Expansion "key"  
 66C "Central" key  
 66F "Reduction" key  
 66X A part for a picture setting control unit  
 67 A Part for Setting Control Units, Such as Power Supply  
 67B "Power supply" key  
 67C "Brightness" key

68 A Part for Arbitrary Directional Movement Control Unit  
69 A Part for Setting Control Units, Such as Cursor  
69X "Front sea bed" key  
69Y "Grade depth line" key  
70 Cruise Data Processing Division Portion  
70A CPU  
71A Input/output port  
71B Input/output port  
72 Memory for Processing  
73 Memory for Work  
74 Memory for Wake-behind-a-Sailing-Ship Data  
75 Memory for Maps  
76 Clock Circuit  
77 Water Depth Memory for Data  
78 Memory for Front Sea Bed Data  
80 Display-Processing Portion  
80A CPU  
81 Display Screen  
82 Picture Element Memory  
82X Cruise related display image  
82Y Sea bed cross-section picture  
83 Memory for Processing  
84 Memory for Display Screens  
90 File Memory Portion  
91 Input/output Port  
100 Navigation Equipment  
B1 Distance width  
B1a Distance width  
CP Named point  
CLX-CLY Cursor line  
CR1 Self-ship wake behind a sailing ship  
CR2 Past wake behind a sailing ship  
EV1andEV2 Consideration point  
JP1 Destination point  
Ld etc. -- depth line  
L1-L5 Route line  
Ld1-Ld5 etc. -- depth line  
Ld 11-13 Depth lines, such as creation/  
LX Latitude  
LY Meridian lines  
M1 Coastline  
P1-P4 Direction changed part  
P21-P26 Intersection position  
RT1 Plan wake behind a sailing ship  
theta 1 Course gap

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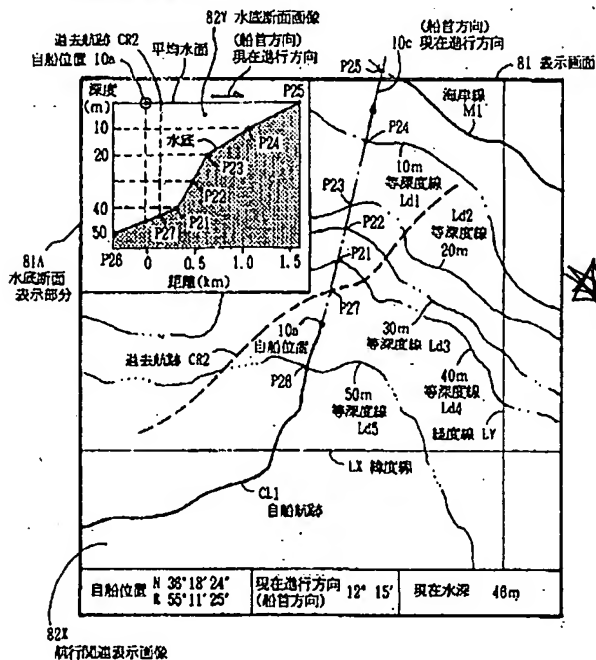
[Drawing 1]

## 〔全体ブロック構成〕



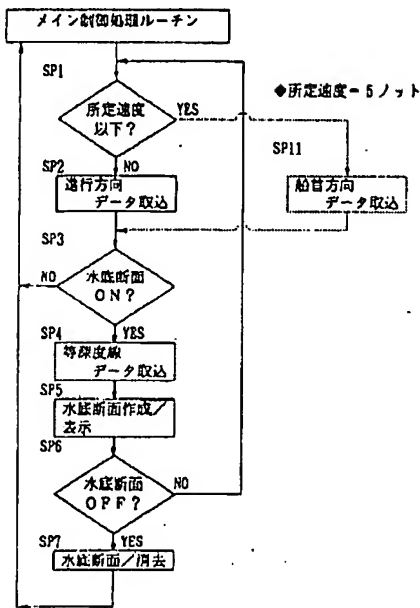
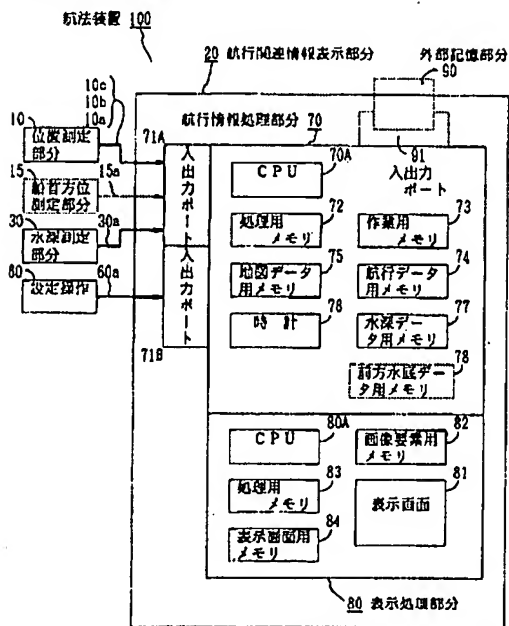
## 〔Drawing 2〕

(要部表示構成)



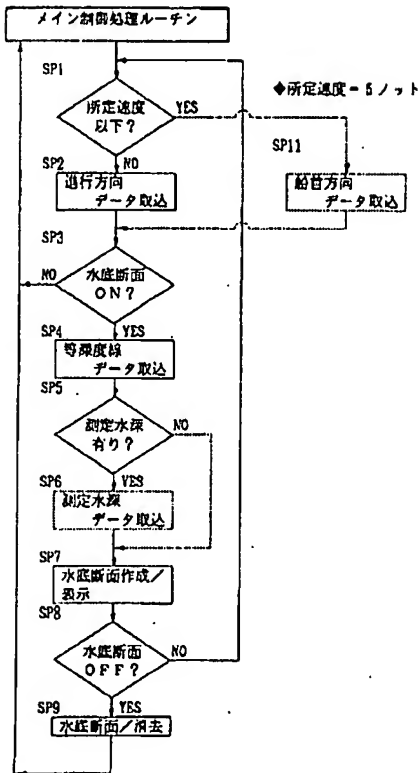
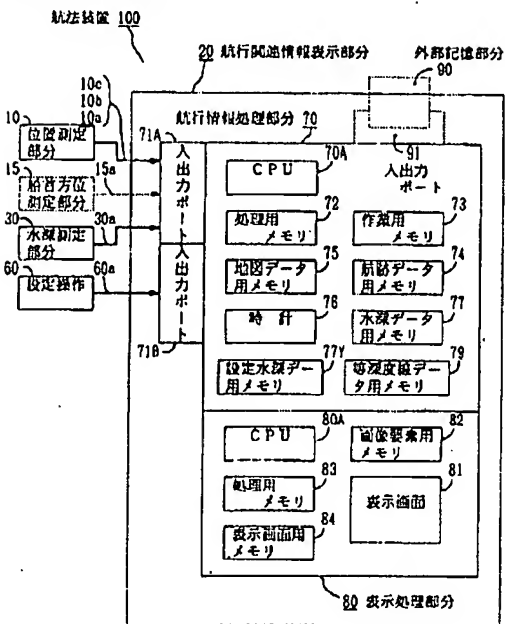
## 〔Drawing 3〕

〔要部制御処理構成〕

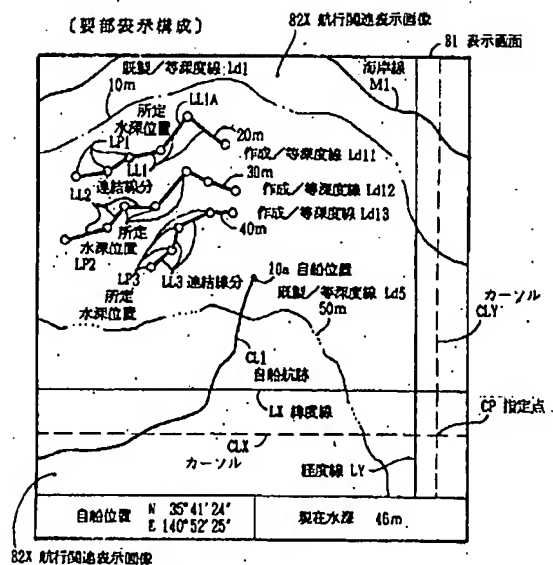
[Drawing 4]  
〔全体ブロック構成〕

[Drawing 5]

## 〔要部制御処理構成〕

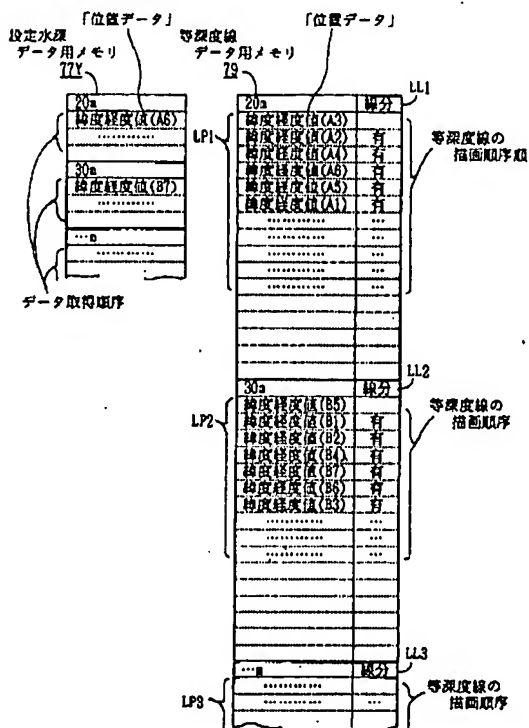
[Drawing 6]  
〔全体ブロック構成〕

[Drawing 7]



[Drawing 8]

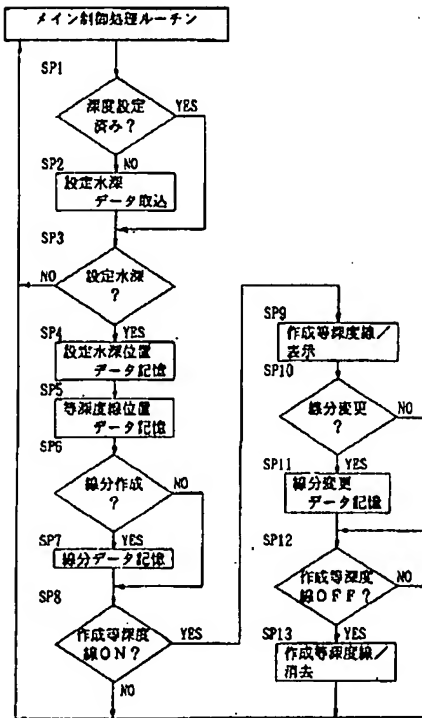
(要部記憶構成)



[Drawing 9]

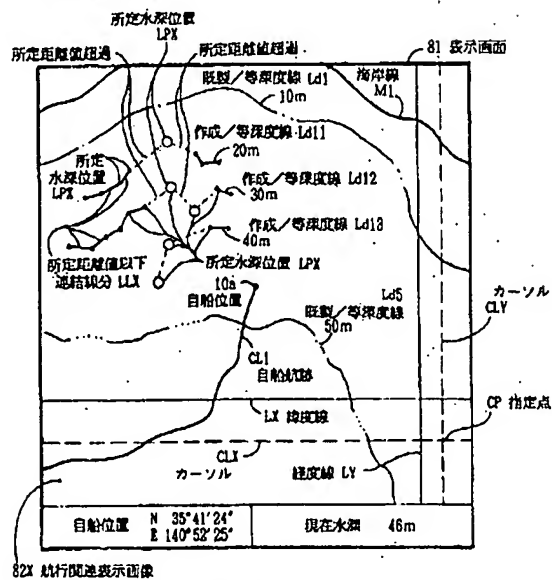


## 〔要部制御処理構成〕

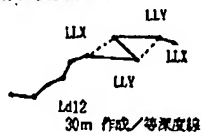


[Drawing 10]

〔要部表示構成〕



〔線分変更構成〕



[Drawing 11]

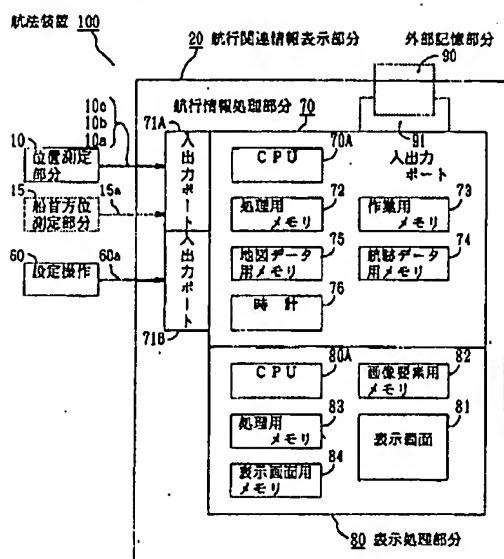
```

graph TD
    Title[メイン制御処理ルーチン] --> SP1
    SP1 --> D1{深度設定済み?}
    D1 -- YES --> SP9
    D1 -- NO --> P1[設定水深データ取込]
    P1 --> SP3
    SP3 --> D2{設定水深?}
    D2 -- NO --> SP1
    D2 -- YES --> P2[設定水深位置データ記憶]
    P2 --> SP5
    SP5 --> P3[等深度線位置データ記憶]
    P3 --> SP6
    SP6 --> D3{所定距離以下?}
    D3 -- NO --> SP1
    D3 -- YES --> P4[線分データ記憶]
    P4 --> SP8
    SP8 --> D4{作成等深度線ON?}
    D4 -- YES --> SP9
    D4 -- NO --> SP12
    SP9 --> P5[作成等深度線/表示]
    P5 --> SP10
    SP10 --> D5{線分変更?}
    D5 -- NO --> SP12
    D5 -- YES --> P6[線分変更データ記憶]
    P6 --> SP12
    SP12 --> D6{作成等深度線OFF?}
    D6 -- YES --> P7[作成等深度線/消去]
    P7 --> SP13
    D6 -- NO --> SP12
    SP13 --> SP1

```

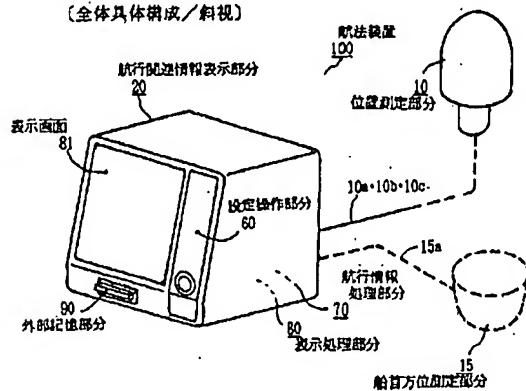
[http://dossier1.ipdl.inpit.go.jp/AIPN/aipn\\_call\\_tran...aw\\_fin\\_v5&Ntt4=&Ntt5=&Ntt6=&Ntt7=&Ntt8=&Ntt9=&Ntt10=](http://dossier1.ipdl.inpit.go.jp/AIPN/aipn_call_tran...aw_fin_v5&Ntt4=&Ntt5=&Ntt6=&Ntt7=&Ntt8=&Ntt9=&Ntt10=) (42 of 46)4/27/2007 11:59:12 AM

## 〔全体ブロック構成〕

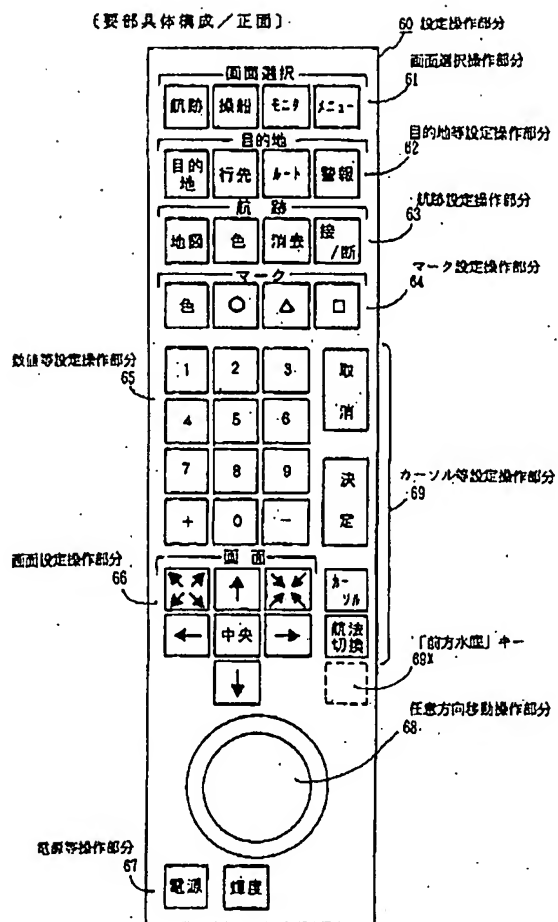


## [Drawing 14]

〔全体具体構成／斜視〕



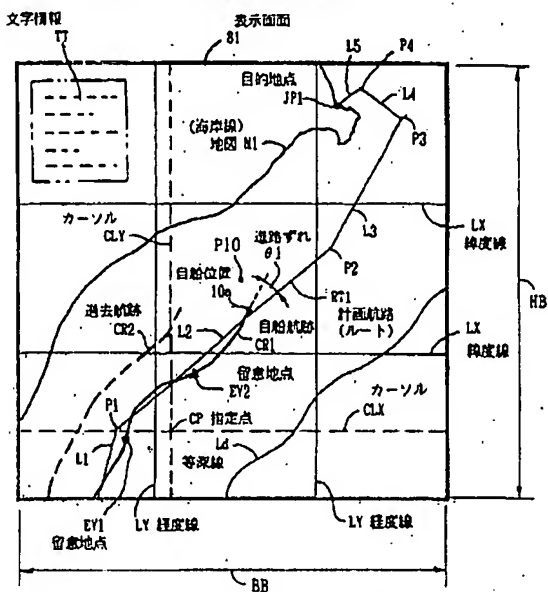
## [Drawing 15]



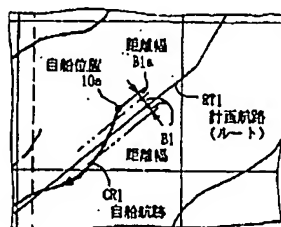
[Drawing 16]

(要部表示構成)

(進路ずれ表示構成)



(距離幅ずれ表示構成)

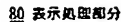


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60 設定操作(835)



〔全体ブロック構成〕

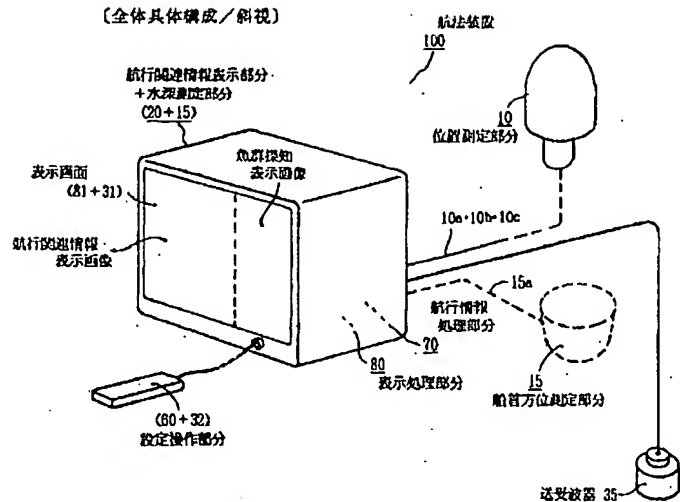


〔全体具体構成／斜視〕



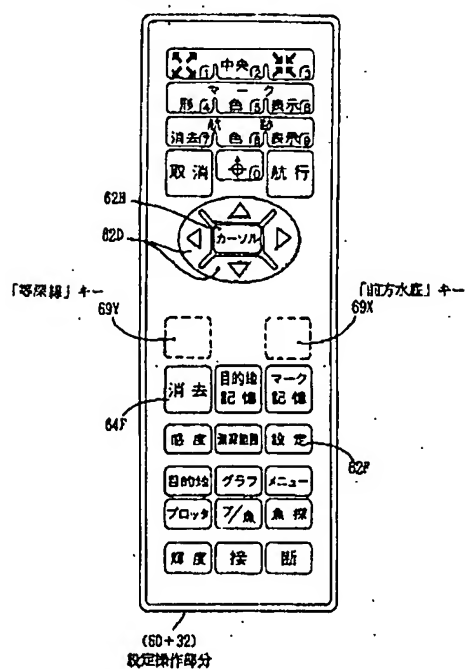
[Drawing 20]

〔全体具体構成／斜視〕



[Drawing 21]

〔要部具体構成／正面〕



[Translation done.]

## Report Mistranslation

Japanese (whole document in PDF)